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Leibniz Institute of Agricultural Development in  
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## Introduction

Combating hunger and malnutrition on a global scale is one of the most important tasks of the international community of nations. In our high-tech age more than 850 million people are starving; more than two billion are suffering from malnutrition.

Agriculture across the world is thus facing new and major challenges. Global agricultural markets have been shifting in the last few years as a result of the changed political and economic conditions in the countries of the European Union as well as worldwide (cue: WTO). In combination with supply and demand, the advanced liberalisation of markets is leading to greater fluctuations in the prices of agricultural products, something to which both agricultural policy and agricultural enterprises have to adjust accordingly. A key aim of policymaking in both strong and less developed economies, therefore, should be to ensure the competitiveness of agricultural enterprises, so that the increasing price fluctuations on the global market can be countered.

According to OECD estimates the average real prices for grain, rice and oilseeds in the next ten years will be around 20 % to 30 % higher than the average of the last ten years. We can also expect, however, much greater fluctuations in prices than in the past decade.

The main causes of the likely long-term price rises are: The increase in the world's population, the change in food habits in emerging nations such as India and China, the constant rise in energy consumption, the shortage and price increase of fossil fuels, the global growth in the cultivation of agricultural raw materials for use as biofuels, and the looming threat of climate change.

Against this background, agriculture across the globe is in a good position and is showing a positive development. The need for agricultural products is rising in both the food and non-food sector. This will give rise to competition for farmland. With an increasing shortage of land, production will have to become more intensive.

The great challenge of our time with regard to food security, moreover, will only be met if the agricultural and food economies of the less developed countries and regions in the world can also benefit from the positive development. Knowledge and technology are in demand, in order to strengthen the agricultural and food economy – in many countries of Central and Eastern Europe, for example – and to activate large tracts of agricultural wasteland in these areas.



*Minister of Agriculture and Environment  
for Saxony-Anhalt, Petra Wernicke*

As a research institute for agricultural economics, IAMO's statutory mission is to undertake research in the field of international agricultural development. In this respect the Institute plays an essential role in investigating problems of agricultural and rural development in the aforementioned regions of the world and recommending appropriate solutions. The evaluation by the Leibniz Association in December 2007 concluded that the core work of IAMO and its staff – monitoring developments of the agricultural and food economy, and of rural areas in the transition countries of Central and Eastern Europe, as well as the economic and social effects of these developments – was outstanding. Since the last evaluation in 2000, IAMO's geographical area of research has expanded to include the enlarged EU, Central and Eastern Asia (chiefly China and Vietnam), as well as South-eastern Europe and Turkey. In addition to this core task, IAMO makes other important contributions as a forum for the exchange of scientific information, in offering further education for academics and decision-makers from the countries which are the target of its research, and in providing research and advice for representatives from politics, administration and business.

As the Minister for Agriculture and the Environment of the Land of Saxony-Anhalt, I very much welcome and share this positive assessment of IAMO's activity. With its analysis and discussion of current agro-political questions, IAMO is also an important partner for our agriculture, including our policymakers. Saxony-Anhalt moreover has cooperative relations with Poland, Estonia, Lithuania and Romania, the goal of which is to accelerate the development of agriculture in these countries. IAMO's research findings and knowledge help us greatly to target our support.

IAMO's positive presence is of benefit to the overall development of Halle as a centre of agricultural economics. Appointments of IAMO professors to the Institute of Agriculture at the Martin Luther University Halle-Wittenberg (MLU) as well as the running of joint research projects should reinforce the standard of agricultural teaching and research at MLU.

As a nationally and internationally recognised centre of expertise in agricultural economics, IAMO has become a forum for dialogue between the academic, political and business communities. Because of this I expect IAMO's work in the various regions of the world will play its part in helping solve the global challenges of our time I outlined at the start: Combating hunger and malnutrition.

I'd like to thank the staff at IAMO for their achievements and, in a similar vein to the recommendations of the Leibniz Association's senate, wish them every success in the continuation of their activities in 2009.

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## Foreword

The past year has seen some important decisions made concerning IAMO's long-term outlook. We now have the official results of IAMO's second external evaluation. In its statement of 9 July 2008, the senate of the Leibniz Association recommended that IAMO should continue to receive unconditional support from the federal government and the Bundesländer (German Federal States). In its sitting of 16 September 2008, the research support committee of the Gemeinsame Wissenschaftskonferenz (GWK, Joint Academic Conference) of the federal government and Länder endorsed this recommendation. With the agreement of the senate – the highest executive organ of the Leibniz Association which now includes 86 research institutions – and the GWK, which is the most important joint body of the federal government and the Länder for the support of science and research, IAMO's funding has been secured for the next seven years. The basis for this decision was an evaluation of IAMO by external, independent referees in December 2007. In their report the inspectors judged the overall academic achievements of IAMO as "very good" .

This assessment is both a recognition of the achievements of staff at IAMO over the last seven years, as well as an obligation for the future. In its statement the senate refers to IAMO's development as "extremely positive" . It highlights in particular the significant rise in the level of third-party funding for research and the marked increase in articles published in international journals. "The research produced and the dissemination of this knowledge are of great benefit for the national and international scientific community, especially in Central and Eastern Europe,"

the senate continues in its statement. "Only IAMO can offer 'opportunities for scholars from transition countries to work and gain further academic qualifications' in such a concentrated and skilled way." The senate also highlighted the excellent support the Institute gives to younger academics. With these achievements IAMO has succeeded in establishing itself as a leading research institute of agricultural economics in transition countries. In the opinion of the senate, "the Institute unquestionably fulfils the requirements demanded of institutions of national importance and federal scientific interest. Within agricultural research in Germany IAMO has a role in forging relationships: It is a key contact both within the discipline of agricultural economics,



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Prof. Dr Alfons Balmann (Director)  
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Prof. Dr Thomas Glauben (Managing Director)*

and for a variety of non-academic groups connected to the subject." In this way, IAMO also reinforces Halle (Saale) as an academic centre in Saxony-Anhalt.

Our task now is to continue this positive trend of the last few years. In November 2008, Dr Xiaobing Wang was the first IAMO researcher to win, with her doctorate, the Leibniz Association Prize for Young Academics. The Leibniz Association Prize for Young Academics is awarded annually to members of the 86 research institutions of the Leibniz Association in the categories humanities and social sciences, and natural and technological sciences. 2008 was also the year in which the *IAMO-China International Research Group* "Economic Dynamics and Social Equilibrium in Rural China" began its project. Financed by the federal government and the Länder under the aegis of the "Pact for Innovation and Research", which is the non-university research institutions" equivalent of the Excellence Initiative for German universities, the first academics, including four from China, started their research. From 2009 IAMO has an important role in a new EU project, "Prototypical Policy Impacts on Multifunctional Activities in Rural Municipalities" (PRIMA), with eleven partners from eight countries. The Institute's agent-based modelling work, which the evaluation report described as excellent, will be central to this project.

Twenty years ago the Berlin Wall fell. In Central and Eastern Europe the transition towards a free-market economy and democracy began with the collapse of the planned economy and one-party rule. Two decades later it is time to take stock. What was the course of transition in the agricultural and food economy? What did it bring for rural development? Is transition complete? Have the expectations of 20 years ago been fulfilled?

Which illusions have been shattered; what knowledge have we gained? These important topical questions are at the heart of the 2009 IAMO Forum "20 Years of Transition in Agriculture", which will take place from 17-19 June in Halle. For the first time the IAMO Forum will be combined with a special session on the same topic organised by the *European Review of Agricultural Economics* (ERAЕ) and the *European Association of Agricultural Economics* (EAAE). The papers from this session and the best papers of the IAMO Forum will be published in a special edition of the ERAЕ.

IAMO's very good to excellent achievements in research, supporting young academics, and scientific exchange could not have happened without our administrative staff. Their dedication and flexibility in the face of the ever-changing demands of an institute competing in the international academic arena are the basis of our success.

Without the active support of the federal government and the Länder, IAMO's continued progress would not have been possible. For their encouragement and help we should like to thank in particular the Federal Ministry of Food, Agriculture and Consumer Protection, the Ministry of Education and Cultural Affairs of Saxony-Anhalt, and the Ministry of Agriculture and the Environment of Saxony-Anhalt. IAMO's work would also be unthinkable without the members of our board of trustees and scientific advisory board. Special thanks go to them for their huge contribution in making the evaluation a success.

The ten articles in this volume illustrate the broad spectrum of transition research undertaken at IAMO. They also demonstrate why transition-specific research, with its own way of posing questions, customised theoretical models, and expanded

methodologies, is always necessary. The first two articles on agroholdings in Kazakhstan and the Ukrainian dairy sector deal with particular transition-related features of coordination between different stages of the value chain in the food economy, which are markedly different from those in Western countries. The third paper contains the findings of a project, carried out by IAMO and funded by the GTZ, on advising the Croatian government about the consequences of EU accession for Croatian agriculture. The fourth article looks at transition-specific institutional problems in the organisation of irrigation systems, while the fifth concerns itself with workforce migration and mobility

in transition economies. The findings of the 2008 IAMO Forum "Agri-Food Business: Global Challenges – Innovative Solutions" are presented in the sixth paper. A theoretical-methodological approach, together with the application of "fuzzy logic" deals with the modelling of income diversification of rural households. The last three articles focus on farms. The first of these looks at the role of age distribution and farm succession in dual farm structures, the second analyses the flexibility of Polish family farms in the transition process, while the third deals with cooperation between farms as a strategy for increasing income.



*Dr Xiaobing Wang, winner of the Leibniz Association's Prize for Young Academics*



*Grain harvest in northern Kazakhstan on a large agricultural enterprise using Western production technology*

# Agroholdings in Kazakhstan – A trend only found in the grain sector?

JÜRGEN WANDEL

## Introduction

Towards the end of the 1990s, Western agricultural economists increasingly began to detect the existence of large vertically, horizontally and, in some cases, diagonally integrated business groups in the agriculture and food sector of some successor states of the Soviet Union. Such structures, which are often termed "agroholdings" in everyday language, are rarely found in the developed market economies of the West. In the most extreme cases, these mega-businesses can encompass up to 1m hectares of land, and they also control processing and trade. Their operations are highly profit driven. Agricultural enterprises are frequently organised as profit centres by a parent company which might well have no background in farming. This phenomenon raises a number of questions, such as the reasons for the establishment of these businesses, how they operate, their development prospects, and the effects they have on the economy. Until now interested parties from the academic and business worlds have focused their attention on the Russian Federation, as the incidence of agroholdings has grown particularly rapidly there since the rouble crisis of 1998 and the general economic recovery which followed. By contrast, little is known about the developments in other countries of the Commonwealth of Independent States (CIS).

This paper throws light on the situation in the second largest country in the CIS, Kazakhstan, which pursued a comparable transition strategy in the 1990s to that of Russia, and whose

double-digit economic growth since 2000 has also been substantially driven by favourable global market prices for raw materials (POMFRET, 2006). The article presents a provisional review of the incidence of "agroholdings" in this country, and seeks to provide some initial explanations.

## Information difficult to find

There are no official data for Kazakhstan which might permit reliable conclusions to be made about the significance of agroholdings in the country's agricultural and food economy, or in individual sectors. For this reason only some initial, provisional answers are possible, based on individual case studies and the testimonies of experts.

The lack of statistical information might be an indication that agroholdings are far less widespread in Kazakhstan than in neighbouring Russia. Discussions with Kazakh agricultural economists have in fact largely confirmed this suspicion. These conversations have also flagged up practical difficulties in data acquisition, not least because of the fact that "agroholding" is not an officially recognised enterprise or legal form (cf. IRBAEV, FRANGULIDI, 2006). First, "agroholdings" do not appear publicly as consolidated groups of enterprises. It is therefore almost impossible for the outside observer to find out whether individual businesses belong to a holding or not. Second, there is no unanimity over how to distinguish "agroholdings" from other

forms of integration. For example, so-called "agrofirms" also integrate several (not infrequently all) members of the entire vertical value chain, but without the company structure taking the form of a holding. It is more the case that the individual stages become departments of a single, amalgamated enterprise, thereby losing their economic and legal independence. Examples of this are "Agrofirma Bereke" or the public company AO APK "Adal" in Almaty province, which are involved with fruit and vegetables, and milk production respectively. Even if the existence of a parent company is seen as a sign of an agroholding, it still remains unclear whether the concept "agroholdings" should be restricted to those groups of businesses that are working strictly in agricultural production, or also include those that are only active in the upstream or downstream sectors. Examples of the latter can be found in the dairy industry. Thus the limited company (TOO) "Agroprodukt", the Kazakh-Israeli joint venture (SP) "Camoni", and the largest producer of dairy products in Kazakhstan, the public company AO "Food Master", only operate in the processing and retail sectors. In this context, AKIMBEKOVA (2006) refers in some places to "integrated structures" and in others to "agroholdings".

In spite of these problems of definition and differentiation, initial studies by Kazakh analysts suggest that integrated groups of enterprises are chiefly to be found in the grain sector, and to a lesser extent in the oilseed and dairy sectors (cf. IRBAEV, FRANGULDI, 2006). AKIMBEKOVA (2006) estimates the number of "agroholdings" in the grain sector to be around 40. They are reckoned to control about 30 % of farmland devoted to grain, and provide two thirds of the grain sold both domestically and abroad.

### **Agroholdings in the grain sector**

IRBAEV and FRANGULDI (2006) make the distinction between large and small agroholdings in the Kazakh grain sector, which exist almost exclusively in the northern provinces of the country (Akmola, Kostanay and North Kazakhstan), the main grain farming regions. According to their research there are about 15 "big players". These include such enterprises as "Ivolga Holding", "Alibi", "Grain Industry" (Zernovaya industriya), "Agrocentr Astan", "BATT-Grain", "Bogvi", "Cesna Astyk" and "Karasu". Most of these have their origins in the grain trade, and have gradually integrated themselves into the upstream sectors of grain processing and production. Some of these large agroholdings themselves are part of business conglomerates which are particularly prevalent in the Kazakh oil, gas, mining and finance industries (see table 1). "BATT-Grain", for example, belongs to the "BATT Group", which operates in the oil, gas, construction, trade and alcohol sectors. "Cesna-Astyk" TOO belongs to the investment group "Cesna" which began life back in 1988. It operates in construction and finance, wholesale and retail, as well as in the agricultural and food sector. It began working in the last of these back in 1992 with the purchase of a grain elevator in Akmola province. Since then the enterprise has expanded its activity to encompass grain farming and the production of compound feed, flour, bread, pasta and beer.

The development of the larger known agroholdings in the grain sector has progressed along similar lines. This is well illustrated by the example of the "Ivolga-Holding". The "Ivolga-Holding" was established by one individual, the former sovkhos director Vasiliy Rozinov, who remains the sole owner of the group. He earned the starting capital for the subsequent expansion by

trading in grain at the start of the 1990s. Rozinov recognised very early on that more money can be earned in grain trading if you have your own storage facilities, because these enable you to react better to price changes. He therefore bought a grain silo in Kostanay, followed later by others. When coordination difficulties with agricultural producers started mounting up soon afterwards, a typical principal-agent problem, and grain deliveries became less and less reliable, Rosinov entered grain farming himself. He bought up debt-ridden agricultural businesses. The management then discovered further potential for profit in flour and compound feed production, and expanded the business into the upstream sector. In 2005 the agroholding started to diversify by entering into Russian sugar and milk production. According to Rozinov, however, this move was more coincidence than a long-term business strategy. In 2005, the Kazakh bank "TuranAlem", which also has branches in Russia, offered Ivolga as one of its regular clients three sugar factories in Kursk province, which were unable to settle their debts. "Ivolga" accepted the offer and also immediately bought up nearby sugar producers so as to guarantee the utilisation of the sugar factories (OSIPOV, 2007).

In 2007 "Ivolga-Holding" controlled around 1m hectares of agricultural land in Kazakhstan, and a further 40,000 ha in Russia (IRBAEV, FRANGULIDI, 2006). Other large agroholdings with a similar development pattern have diversified in oilseeds (e.g. "Maslodel" and "Vita Soy") or have integrated forwards into other processing stages, such as bread and pasta production, and retail. Examples of the latter are "Cesna-Astyk" and "Grain Industry" which, by comparison with "Ivolga-Holding", farm only a modest 40,000 and 100,000 ha respectively.

According to IRBAEV and FRANGULIDI (2006), smaller holdings in the grain sector differ from large ones by the fact that they have a limited involvement in grain exports, and by their lower processing capacity. They usually control several agricultural enterprises, but do not own more than two large silos and/or grain mills. Examples of this category of agroholding are "TNK", "KazAgroTrade", "Kunaykhleprodukt" and "Ellinvest". The last of these owns one elevator, a compound feed factory and four farms with a total area of 36,000 ha. Meanwhile, "Ellinvest" has gone further in its vertical integration by taking over the production and processing of poultry and pork. Table 1 summarises the main characteristics of selected grain holdings.

### **Attempts at analysis**

The examples given above point to the conclusion that agroholdings in Kazakhstan are essentially the result of "alert" entrepreneurship in country-specific conditions during the transition period. The concept of the "alert entrepreneur" was invented by ISRAEL M. KIRZNER (1978), and in the market process theory of the Austrian School is considered to be the driving force in competition, which itself is understood as the discovery procedure of profitable products, technologies as well as institutional arrangements (cf. HAYEK, 1968/94). Alertness is understood as the recognition and use of untapped profit potential. This could equally be the detection of price differentials on the basis of information asymmetries, or the discovery of new ways to use resources more efficiently and combine these to make new profitable products (cf. KIRZNER, SAUTET, 2006). Only continual testing by the market can show whether potential opportunities have been correctly identified. Alert entrepreneurship does not assume perfect markets. On the contrary, in perfect markets in

**Table 1: Features of selected grain holdings**

<b>Company</b>	<b>Year founded</b>	<b>Started by</b>	<b>Areas of business</b>	<b>Agricultural land</b>
TOO "BATT-Grain"	1992-2006	Conglomerate with stakes in the oil and gas sectors, construction and sales	Farming and processing of grain to make compound feed, flour and bread products, and sales operations. From 2007 operations restricted to drinks production.	Up to 2006: No figures Since 2006: 0 ha
TOO "Cesna-Astyk"	1992	Investment company "Cesna" (diversified group with stakes in the finance, construction and media sectors)	Production and processing of grain to make flour, bread and pasta products, wholesale and retail sales, beer production	40,000 ha
"Ivolga-Holding"	1992	Vasily Rozinov (entrepreneur from the grain trade)	Production, processing and sale of grain (flour, compound feed), sugar and raw milk production (in Kazakhstan and Russia)	1m ha in (north) Kazakhstan  140,000 ha in Russia
TOO "Grain Industry Group"	1996	Mill combine	Production and processing of grain (flour, bread and pasta products) as well as sales; low-level milk and oilseed production	100,000 ha
AO Agroholding "ElInvest"	2004	Compound feed business	Production and processing of grain (compound feed), poultry and pork production, meat processing	36,000 ha

Source: Author's own illustration based on Kazakh sources from journals, newspapers and the Internet.

equilibrium "there is nothing left for the entrepreneur to do. He cannot find any opportunities to buy from sellers who underestimate the buying demand of their potential purchasers, in order to sell himself to these purchase-hungry buyers...He cannot, therefore, make any contribution to the reallocation of resources or products, so as to eliminate inefficiency and lack of coordination that result from ignorance, because there is no ignorance or lack of coordination" (KRIZNER, 1978, p 21). In contrast to the reasoning of neo-classical economists where a lack of coordination has been identified, it is not the omniscient and benevolent state which eliminates inefficiencies by corrective interventions, especially of a fiscal nature, in the markets, but the alert entrepreneurs. To achieve this, however, they need an institutional environment that is protected by the state, and which enables entrepreneurial alertness to develop. Principally this means: (1) clearly defined and protected rights of disposition over resources, (2) freedom of action and contract, (3) unrestricted access to all markets, (4) a low tax burden and freedom from other controls on company performance such as the setting of maximum profit limits, because otherwise this weakens the importance of business profit as a fundamental stimulus for entrepreneurial activity.

Studies of Kazakhstan's economy are now showing that the country has made considerable progress in creating a formal entrepreneur-friendly environment, and this has contributed to the sustained economic boom since 2000. Amongst other things, there has been the introduction of private ownership of land – for a long time a controversial issue – business taxes have been continually reduced and simplified, and the banking system has been reformed to become one of the most efficient

in the whole of the CIS. The question still remains, however, as to why some businesses in some sectors have developed a preference for a form of organisation that is an "integrated group of enterprises with a holding structure". Economic theory offers an array of possible explanations for this (cf. JOSKOW, 2005). Some commentators highlight reasons relating to production technology, such as technological interdependencies in the production process and market power motives; others point to transaction costs and principal-agent problems, brought about by conflicting relations between formal and informal institutions in a society (cf. HOCKMANN et al., 2003; KOESTER, 2005).

In fact, informal, bureaucratic constraints and corruption are still serious obstacles to entrepreneurial activity in Kazakhstan, in spite of major government efforts and the considerable progress already made (cf. POMFRET, 2006). Problems of inexpensively enforcing contractual obligations relating to payment, quality and other aspects, through the courts if necessary, increase the transaction and agency costs where there is unattached market coordination, and thus favour integration along the lines of the motto: *"If you want something done right, do it yourself"* (SAPPINGTON, 1991). In the grain sector, factors relating to production technology can also favour large business units, because these can exploit returns to scale and favourable global market prices for wheat (cf. also GRAY, 2000; IRBAEV, FRANGULIDI, 2006). The transaction and agency costs within the group have to be set against this, however. The withdrawal of some groups from agricultural production, such as "Bogvi", "Agrocentr Astana", "Alibi-Agro" and "BATT Grain", show that these costs can be substantial. The director of "BATT Grain", Evgenij Karabanov, emphasises that principal-agent problems do not disappear with integration

through the acquisition of stock: "As an owner and manager myself, I believe that you cannot effectively be in charge of more than 10,000 ha of farmland. Everything in excess of this figure has to be delegated to another manager. But it is extremely difficult to find trustworthy managers who not only want to be in charge of such large areas, but who also have the expertise to do so" (cited in ISRAEV, FANGULIDI, 2006, p. 15). The withdrawal of "BATT Grain" and other agroholdings from primary production is another sign of alert entrepreneurship. Things were different with a structure that emerged in December 2006 – the National Holding AO "KazAgro".

### **The National Holding AO "KazAgro"**

The National Holding "KazAgro" is not what its name might first suggest; it is not an agroholding along the same lines as the integrated groups of enterprises cited above. It is an instrument of state economic and agricultural policy, i.e. a sort of state agency for economic development. Copying models from Singapore ("Temasek") and Malaysia ("Khazanah"), the Kazakhstan government has established three more similar state holdings: "Samruk" (Kazakhstan Holding for Management of State Assets JSC), "Kazyna" (National Fund for Sustainable Development JSC), and "Samgau" (National Scientific and Technological Holding JSC). The task of all four national holdings is to consolidate various state and semi-state enterprises and development institutions, so as to improve management and coordination between them, as well as stimulate larger investment in infrastructure and in so-called "priority sectors". The establishment of these state holdings is part of the diversification policy that has been pushed forward since 2003, in order to counteract the predominance of raw materials in the Kazakhstan economy. This policy promotes

the classification of those economic sectors thought to be particularly important and competitive, as set out by an action programme of 2004 providing for the development of clusters – regional concentrations of businesses that belong to the same or closely related sectors. These priority sectors include the agricultural and food sector, as well high technology. "KazAgro" is responsible for implementing the development strategy in the agricultural and food economy, and "Samgau" in the high-tech sector. "Kazyna", which unites seven state development institutions, operates cross-sector, while the role of "Samruk" is to efficiently manage the 19 largest state interests (including "KazMunaiGas", "Kaztelekom", "Air Astana") and carry out privatisations.

"KazAgro" unites the following seven state institutions – all of whom are legally joint stock companies – who hitherto have had the task of implementing state agricultural policy and used to be directly under the minister of agriculture: "Food Contracting Corporation JSC", which operates chiefly in the grain sector and stabilises the internal market as a wholesale buyer; "KazAgrofinance JSC", which supports the financing of purchases or the leasing of agricultural inputs; "Agrarian Credit Corporation JSC", which supports credit cooperatives in rural areas; "KazAgroGarant JSC", a risk insurer; "KazAgroMarketing JSC", which promotes the marketing infrastructure; the "Fund for Financial Support of Agriculture JSC", which promotes access to credit and insurance services; and "Mal oenimderi korporatsiyasy JSC", which is involved in the development of livestock production. As well as improving business management, the main task of "KazAgro" is to implement government plans for the sustainable development of the agro-industrial complex 2006-2010. These include the

direction of investments into sectors of special importance, the development of the infrastructure, regulation and stabilisation of domestic agricultural markets, assistance with the formation of clusters, and the implementation of the February 2007 "30 Corporate Leaders" programme in the agricultural and food sector.

Critics see "KazAgro" and the other state holdings as just more bureaucratic institutions which are taking over tasks that ought to be the work of the ministries, meaning that overlaps are unavoidable. There is also scepticism as to whether an unbundling of economic and political interests can succeed. On the one hand the national holdings are supposed to implement economic policy, yet on the other they must operate efficiently like private enterprises and increase the business value of their daughter companies. This latter objective may be one of the reasons why independent businessmen and academics from both Kazakhstan and abroad have been appointed to the boards alongside government representatives. It is, however, too early at the moment to give a verdict.

### **Conclusion**

Based on provisional knowledge, we can say that agroholdings in Kazakhstan have predominantly emerged in the grain sector as the result of alert entrepreneurship in conditions specific to the country and to the process of transition. No evidence points to explicit state support for this form of enterprise. On the other hand, agricultural policy, with the help of the state holding "KazAgro", is attempting to support the development of clusters, that is to say a very specific form of industrial organisation, and, since 2007, to enlist the service of national champions. It is almost impossible to say at this early stage whether this will favour

integrated groups of businesses. Research in this area is faced with the problem that, even more acutely than in Russia, there is a lack of data which might permit reliable conclusions about the reasons for the emergence of these structures, their development prospects and their effects on the economy. Substantially more research is needed here, therefore. In the case of Russia, IAMO is trying to pursue this question as part of a research project funded by the DFG (German Research Community). Field research with Russian partners is an important part of it. In order to establish the similarities as well as country-specific features of the "agroholding" phenomenon, there ought to be a geographical extension of the project at a later date to Kazakhstan and Ukraine.

### **Further literature**

AKIMBEKOVA, G. U. (2006): Formirovanie effektivnoy sistemy proizvodstva, pererabotki i sbyta sel'skokhozyaystvennoy produktsii, Almaty.

GRAY, J. (2000): Kazakhstan: A review of farm restructuring. *World Bank Technical Paper No. 458*. Washington, D.C.: The World Bank.

HAYEK, F. A. VON (1968/94): Der Wettbewerb als Entdeckungsverfahren, in: HAYEK, F. A. VON: *Freiburger Studien*, 2<sup>nd</sup> ed., Tübingen, 1994, pp. 249-265.

HOCKMANN, H., WANDEL, J., SHAIKIN, V. V. (2003): Integrated structures in the Russian agro-food sector, in: FACULTY OF ECONOMICS, SPLIT (ed.): *Enterprises in Transition: Proceedings. Fifth International Conference on Enterprise in Transition, Split-Tucepi, May 22-24, 2003*, pp. 1234-1254.

IBRAEV, A., FRANGULIDI, S. (2006): Zerno: Chto poseesh', to pozh-nesh', *National Business*, No. 11 (37), November-December pp. 14-19.

JOSKOW, P. L. (2005): Vertical integration, in: MÉNARD, C., SHIRLEY, M. M. (eds.): *Handbook of New Institutional Economics*, Dordrecht, Berlin, Heidelberg, New York, pp. 319-348.

KIRZNER, I. M. (1978): *Wettbewerb und Unternehmertum*, Tübingen.

KIRZNER, I. M., SAUTET, F. (2006): The nature and role of entrepreneurship in markets: Implications for policy, *Mercatus Policy Series, Policy Primer No. 4*, Mercatus Center, George Mason University.

KOESTER, U. (2005): A revival of large farms in Eastern Europe – How important are institutions?, *Agricultural Economics*, 32 (s1), pp. 103-114.

OSIPOV, A. (2007): Vasiliy Rozinov: Holdingi dlya togo I soz-dayutsya, chtoby ekonomit' na vsem, *Agrobiznes*, No. 5, <<http://www.agro-investor.ru/archive/2007/5/2825.html>>.

POMFRET, R. (2006): *The Central Asian economies since independence*, Princeton, Oxford.

SAPPINGTON, D. E. M. (1991): Incentives in principal-agent relationships, *Journal of Economic Perspectives*, Vol. 5, No. 2, pp. 45-66.

## Vertical cooperation: Motives and strategies in the Ukrainian dairy sector

MARYNA MYKHALENKO, FRANZISKA SCHAFT, ALFONS BALMANN

Since the beginning of the phase of upheaval at the start of the 1990s, transition processes – and increasingly globalisation as well – have had radical effects on the coordination mechanisms of the agricultural and food economy in the countries of Central and Eastern Europe. During privatisation and business restructuring, the business and coordination structures once characterised by strong vertical integration collapsed in the early stages of transition. In the last few years, vertical cooperation has increasingly emerged again as a potentially successful strategy in Central and Eastern European agricultural value chains, as well as in other sectors of the economy. There are many factors behind this; of particular significance have been development trends in retail, and the rapid spread of international and domestic hypermarket and supermarket chains. In Ukraine these are companies such as Fozzy Group, ATB Market, Metro C&C, Auchan Group, REWE and many others. An increase in processes of concentration in food retail are leading to the creation of oligopsonistic market structures in Ukraine, too, with potential market power vis-à-vis the upstream stages of the value chain which tend to be organised polypolistically. This is putting pressure on the processing sector as well as farmers to lower costs by rationalising as much as possible, both within the business and externally. It is also the case that the strong growth in consumer purchasing power has led to increasing consumer requirements regarding the product quality, or the safety and traceability of foodstuffs. Overall, these processes favour

a transformation from sellers markets to buyers markets in Ukraine. At the same time, the increased use of vertical coordination strategies is a response to the transition-specific difficulties faced by the markets concerned. In Ukrainian agriculture, for example, access to credits and input factors is often seriously impeded by poor liquidity or high investment risks, such as untapped production efficiencies, variable yields, volatile market prices or a lack of agricultural insurance schemes. In addition, agricultural businesses and enterprises often lack sufficient technological provision. In many areas, agricultural production is dominated by very small farms or household farms as part of a dual agricultural structure. Late or overdue payments also hamper the building of trust between the various actors in the market. The very slow establishment of transparent institutions encourages corruption, provides poor legal security as far as transactions are concerned, and thus impedes investment overall in Ukraine.

Vertical cooperation can help reduce transaction insecurity and facilitate access to input factors, technology, capital and know-how. HANF/DAUTZENBERG (2008) see vertical cooperation as a form of voluntary cooperation between at least two financially and legally separate businesses at different production stages, which creates a harmonisation of process amongst those firms concerned. In the Ukrainian dairy sector there are fundamental problems with the organisation of vertical cooperation due to marked information asymmetries, mistrust between actors, a

low level of transparency, a lack of coordination mechanisms on the dairy market, insecurity relating to milk deliveries, and an insufficient milk supply which is often of poor quality.

Much evidence suggests that insufficient technological provision within enterprises, communication problems and a lack of information about quality requirements are the greatest challenges facing the Ukrainian dairy sector. And yet important questions about the increase in vertical integration within the Ukrainian dairy sector remain unanswered. Beginning with an outline of the starting conditions in the Ukrainian dairy sector, this paper will give an analysis of the motives, trends and strategies behind vertical cooperation between processing firms and milk producers in Ukraine.

### **The development of the Ukrainian dairy sector**

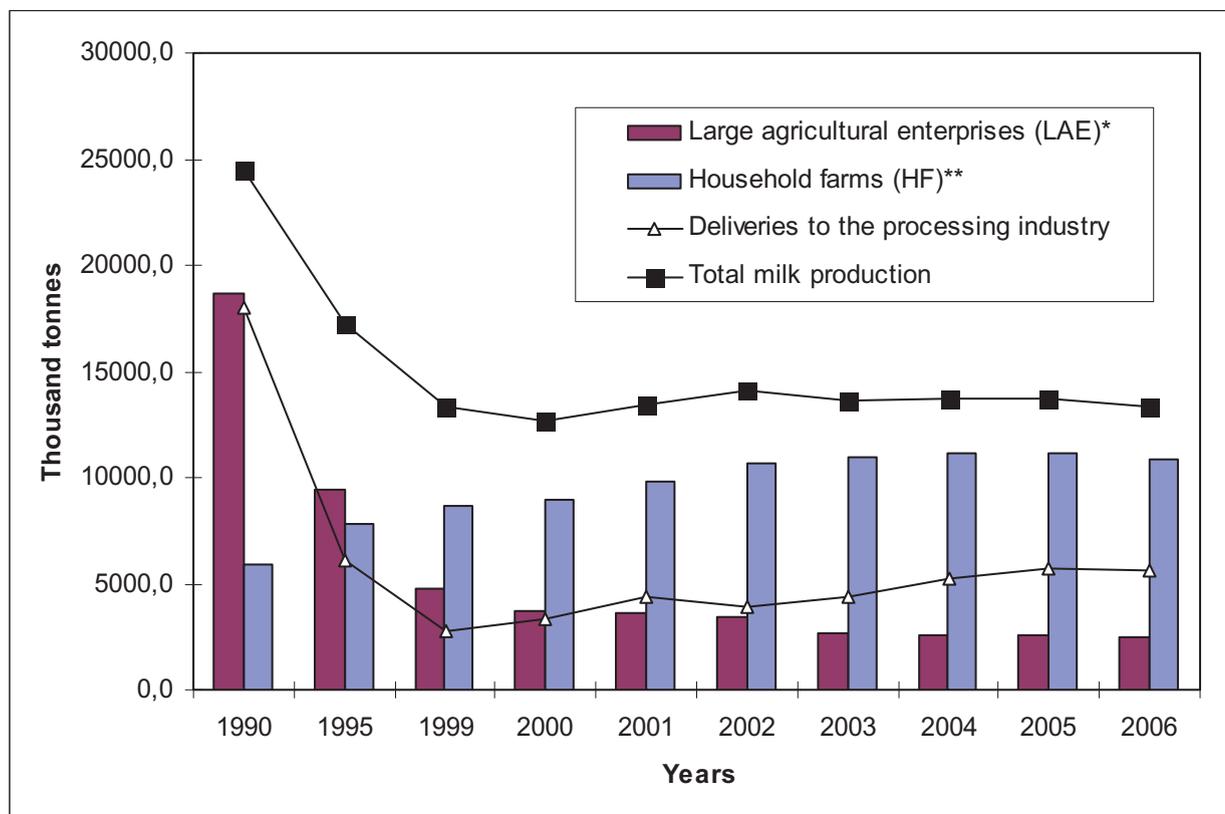
Until the start of the 1990s the Ukrainian milk-processing industry was in state ownership. The reform measures brought about sweeping structural and legal changes for the Ukrainian dairy sector. Until that time, production and delivery planning had been devised by the state planning committee. In the past, agricultural producers were closely linked to their processing enterprises by a centrally planned purchasing and distribution model (PEREKHOZHUK, 2007). With the dissolution of the planned economy, these coordination mechanisms and networks between producers and processors soon collapsed. This meant that the actors in the dairy sector were forced to adjust their forms of cooperation very rapidly to the new conditions.

When the transition process began, overall milk production in Ukraine dropped substantially, reaching its lowest level in 2000 with 12.6 tonnes (51 % of 1999 production). This negative trend

was chiefly due to the drop in production at large agricultural enterprises (LAE). At the same time, production volumes shifted both relatively and absolutely from large agricultural enterprises to household farms (Fig. 1). Whereas in 1990, more than 76 % of milk was still produced by large enterprises, by 2006 more than 80 % of total milk production came from household farms. The drop in production in large enterprises resulted in a demand surplus on the market. This led to reduced capacity utilisation in the dairies. In comparison to the starting year, by 2006 deliveries of raw milk by dairy farms to the processing industry had dropped to one third. At present it is mainly small household farms that deliver milk to the downstream production stage. In 2006, more than 60 % of all milk deliveries came from these farms, and only 32 % from large agricultural enterprises or imports (8 %) (UKRAINIAN NATIONAL OFFICE FOR STATISTICS, 2006). Milk deliveries from household farms usually mean higher transport and quality-control costs; they are also more time-consuming. As this system involves a large number of small deliveries of variable quality, the processing firms must devise complicated logistical plans for milk collection. At present, organising milk deliveries so that they run as a smooth process is a major challenge for milk-processing businesses. Uncertainty over deliveries and pronounced seasonal variations in quantity also increase the need for vertical control mechanisms.

Over the last few years investment in the Ukrainian agricultural and food economy has risen, even though the unstable political situation and the moratorium on the acquisition of agricultural land represent limiting factors. Many stages of the value chain, such as the processing industry and retail, are registering dynamic performance indicators and high levels of investment. By contrast,

Figure 1: Milk production, producers and deliveries to the processing industry in Ukraine, 1990-2006



Source: Own illustration, UKRAINIAN NATIONAL OFFICE FOR STATISTICS.

Notes: \* Agricultural enterprises with varying legal forms, successor businesses to kolkhozes and new businesses.

\*\* Household farms which mainly produce for their own consumption and sell surpluses.

there has been relatively little investment in the dairy industry with its frequently outdated facilities, lack of capital and poorly trained workforce and management. The quality manager of a large Ukrainian dairy gives the following verdict on the situation milk producers find themselves in: "Frequently, the support programmes within vertical coordination are the milk producers' only hope of improving their financial situation." By the same token, vertical cooperation mechanisms are becoming ever more important for Ukrainian milk-processing firms, too, as a way of ensuring that efficiency advantages are exploited, for example with regard to securing deliveries.

### **First empirical results**

In November 2006, as part of a preliminary study, an investigation was carried out into the willingness and motives of businesses in the Ukrainian dairy sector to enter into vertical cooperation. Existing cooperation initiatives were also examined in more detail. The study focuses on forms of cooperation between the production and processing stages, and thus on one segment of the value chain. Using expert interviews, the first phase of research was a survey of decision-makers from the processing and production stages.

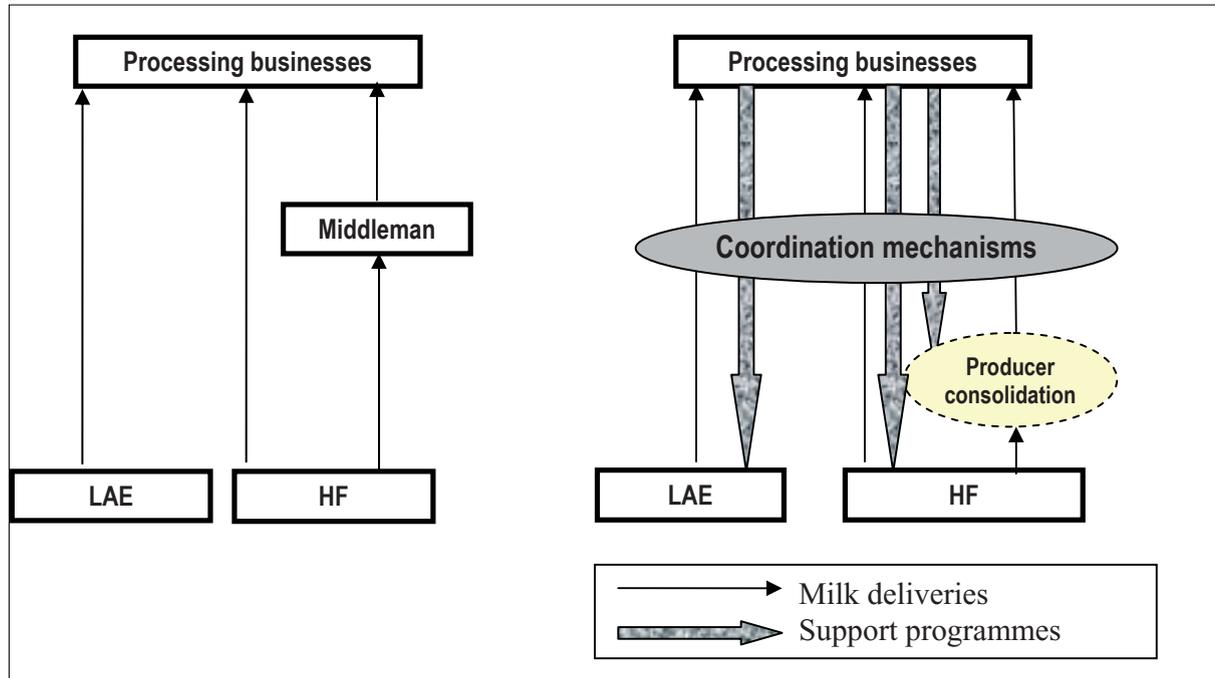
### **Motives of vertical cooperation**

From the processors' perspective there are problems in a number of areas associated with how cooperation with producers is organised. Most processing enterprises point to the poor supply of high-quality raw milk which, in the opinion of those surveyed, substantially limits further business development. The current structure of deliveries accurately reflects the situation in the milk producer market. Thus for many of those firms surveyed, large

enterprises are only responsible for around 30 % to 40 % of total milk deliveries; the majority come from household farms. A frequently cited problem in this respect is that many of these small farms only deliver low-grade milk. As far as the processors are concerned, the planning and organisation of milk deliveries are also hampered by poor coordination mechanisms and contracts. Although most cooperation with large agricultural enterprises is regulated by contract, deliveries from household farms represent purchases on a spot market, in advance of which there is no contract or negotiations. Collecting milk from household farms makes coordinated delivery planning and quality control difficult, and requires complex logistical planning. Milk deliveries from large agricultural enterprises, on the other hand, are cost-effective even when coming from twice the distance. In many cases, moreover, cooperation is hindered by communication problems with producers. Processing firms often have no direct contact with their milk producers. This is especially true of household farms. For their part, the milk producers often have insufficient knowledge of the hygiene and quality standards demanded by the processors. In addition to communication problems and information asymmetries, milk processors also think that many farmers lack the motivation to produce high-quality milk or to keep to agreed schedules and quantities. Frequently, however, with late payments, low prices, and a failure to pay supplements for quality, the processors for their part send out unimpressive signals to milk producers.

Those milk-processing firms surveyed are striving to build strong, long-term relations with their producers, and they have introduced a variety of support programmes. Cooperation with milk producers should raise the productivity of dairy farming,

Figure 2: Coordination mechanisms and producer consolidation in the Ukrainian dairy market



Source: Own illustration.

Notes: LAE = large agricultural enterprise, HF = household farm.

thereby obviously increasing the milk deliveries to the processing industry. Overall, the business representatives who took part in the survey cited the following motives for cooperation: Guaranteeing milk deliveries, an increase in milk quality, the building of a trusting relationship with milk producers, and a reduction in organisational and transport costs. The processing firms believe that cooperation represents a win-win situation for all partners. They also see advantages for producers, such as a guaranteed market for their milk or improved access to important input factors, technology and capital.

### Cooperation strategies

Two different forms of cooperation between the processing and production stages can be identified (Fig. 2). In the first of these there are no coordination mechanisms, and a middleman is often used to work together with household farms. In most instances an independent person or an outside business takes on the role of the middleman. They collect the milk from the household farms and deliver it to the processing firms. Of those businesses surveyed only one uses the services of a middleman, however; the rest work directly with the producers.

The firms surveyed use a variety of coordination mechanisms to build up cooperation between the processing and production levels. Many processing businesses use *price incentives* in the form of extra payments for increased milk deliveries and quality. Household farms are frequently offered *technical assistance* in the form of financial and organisational support. The establishment of milk-collection centres is a common example of this. Local milk collection is organised by means of a contract with the village authorities, and in return the commune provides the necessary infrastructure in the form of buildings and tools.

The village authorities are also provided with the necessary equipment which they then pass on to the producers. Almost all businesses surveyed have introduced this form of cooperation with household farms. On the other hand, some milk-processing firms have opted for direct *financial support* in the form of credits and part-financing, particularly where large agricultural enterprises are concerned. This measure is used especially with those large agricultural enterprises that have proved to be reliable partners over a long-term period of cooperation. In addition to a milk delivery contract, a credit contract is signed between the processing firm and the milk producer, in which a redemption payment is set against milk deliveries over a fixed period of time. As processing firms often work together with dairy technology providers, they can pass on existing synergy advantages to producers, to the benefit of both parties as much better payment conditions can be offered. In an attempt to increase milk producers' expertise, milk-processing firms are organising *further education seminars* for business managers and specialists on various topics such as selection, the feeding of dairy cattle, modern technology in milk production, and quality standards.

One of the businesses surveyed has even opted for vertical integration by buying into, and taking over, two large milk producers. In comparison with the credits and part financing offered within *vertical cooperation*, this is more capital intensive and requires a much higher level of organisation. The advantage of such integration is the complete control over the integrated stages of production. The strategies listed above are either applied separately or in combination with each other. The establishment of milk collection centres by processing firms often gives rise to a development of horizontal cooperation, too, as producers join forces.

### **Conclusion**

Vertical cooperation can be an appropriate way of coordinating different production stages in the Ukrainian dairy sector. Many different strategies have been observed, whose objectives are to exploit the potential of efficiency, quality and logistics. Vertical cooperation can also present obstacles, however, most of which are the consequences of communication problems, information deficits related to these, and poor transparency. Trust appears to play a particularly important role in the building-up of cooperation between production stages. There is also a need for further research at the business level into the effects of vertical cooperation mechanisms.

### **Further literature**

HANF, J. H., DAUTZENBERG, K. (2008): Vertikale Kooperationen der Agrar- und Ernährungswirtschaft – Herausforderungen für das Management, *Berichte über Landwirtschaft, Vol. 86, No. 1*, pp. 103-115.

PEREKHOZHUK, O. (2007), Marktstruktur und Preisbildung auf dem ukrainischen Markt für Rohmilch, in: LEIBNIZ-INSTITUT FÜR AGRARENTWICKLUNG IN MITTEL- UND OSTEUROPA (eds.): *IAMO 2007*, Halle (Saale), pp. 41-46, <[http://www.iamo.de/dok/iamo2007\\_de.pdf](http://www.iamo.de/dok/iamo2007_de.pdf)>.



# Croatia's EU accession: Socio-economic assessment of farm households and policy recommendations

JUDITH MÖLLERS, GERTRUD BUCHENRIEDER, PATRICK ZIER

On 6 February 2008, the EU Commissioner for Enlargement, Olli Rehn, announced that the accession negotiations with Croatia were progressing well. As with the new member states (NMS), which entered the EU in 2004 and 2006, the agricultural sector is at the heart of negotiations with Croatia. This paper briefly outlines current empirical findings relating to the process of rural development in Croatia, agricultural enterprise structures, and national policy in these areas. It is based on the project "Croatia's EU accession: Socio-Economic Assessment of Farm Households and Policy Recommendations", which was supported financially by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) between September 2006 and December 2007 (project number 81087939) – the members of the consortium are listed at the end of the article. The analyses relating to Croatia presented here are based on a microeconomic data set of around 140 family farms, which were surveyed in 2007, as well as secondary data. Expert interviews carried out in Slovenia offer valuable insights into the now completed negotiations with the European Commission over the agricultural chapter of their accession bid.

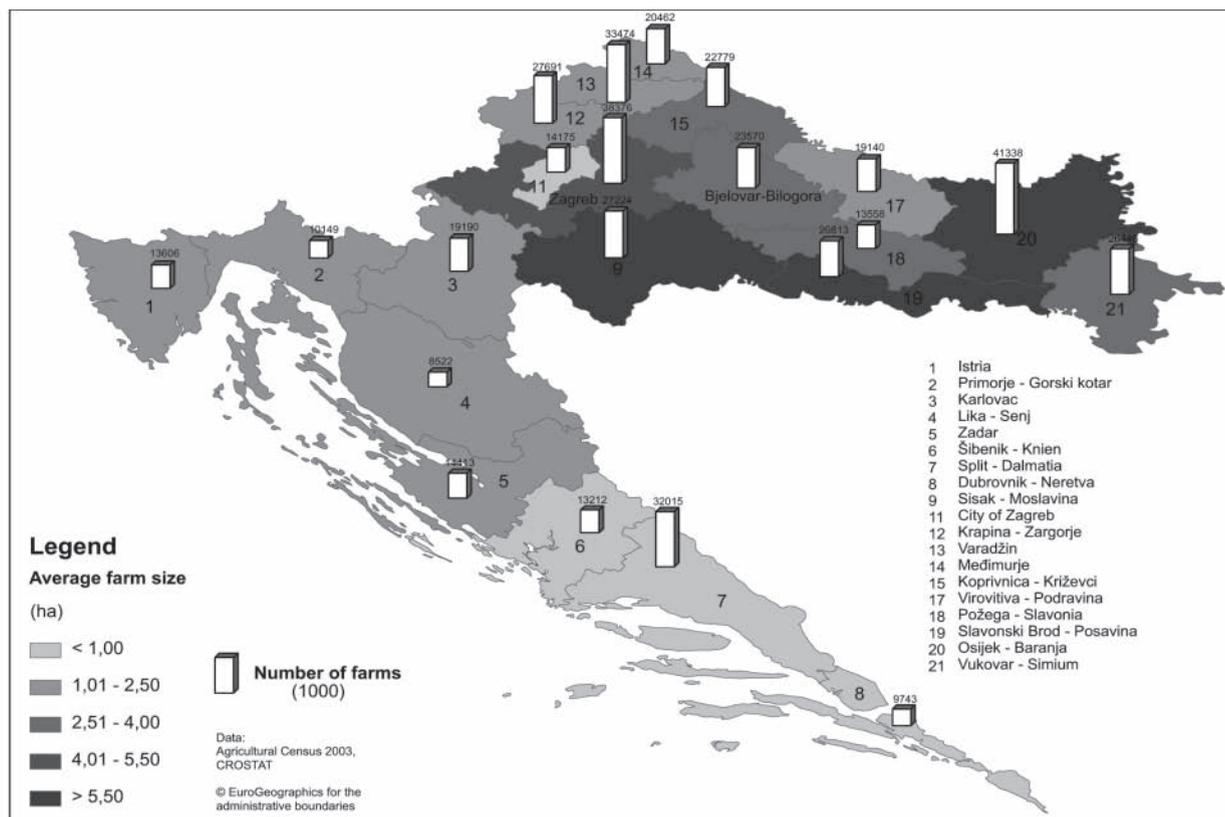
## Structural change in Croatia's family farms

A substantial number of Croatian farms are relatively small, operating only up to three hectares of land. Only few family farms have access to more than ten hectares of land. Besides arable farming, milk production plays an important role in Croatian agriculture, accounting for about 25 % of agricultural

income on average. It is the largest sub-sector. Family farms own 95 % of dairy cattle, and this works out at an average of three cows per holding. In many cases these small farms cannot sufficiently sustain a family. Only 25 % of farms surveyed can be classified as full-time businesses. Part-time farms (10-50 % non-farm incomes) are differentiated from subsidiary and hobby farms (more than 50 % non-farm incomes) by the proportion of income earned outside of agriculture. Part-time farms account for 12 % of agricultural enterprises; subsidiary and hobby farms for 63 %. Overall, more than a third of all income across all types of farms comes from outside of agriculture.

Although most farms are run on a hobby or subsidiary basis, families' way of life and livelihoods are closely bound up with their agricultural activities. Especially when non-farm work is poorly paid or not secure, agriculture functions as a back-up. For this very reason it seems unlikely that the large number of subsidiary farms will drop in the medium term. Full-time farms are in a comparatively better situation as far as income is concerned, and exhibit in particular a higher level of farm returns with regard to land use. Figures show that these farms earn, on average, four times as much per hectare of land than part-time or subsidiary and hobby farms. Income relative to labour input is also higher on full-time farms. This is a result of more intensive livestock production methods and a better provision of physical capital. The average annual income per capita from all employment undertaken by family members is €7,675 on full-time farms,

Figure 1: Farm sizes in ha and regional distribution of number of farms in Croatia Figure



Source: Own depiction. Data from CROSTAT, CENSUS OF AGRICULTURE (2003).

€6,386 on part-time farms, and €4,718 on subsidiary and hobby farms. No link has been found between agricultural income per labour unit and educational levels. This is not the case with regard to non-farm income, which increases with the number of years an individual has spent in education. Overall the average level of education is low: 36 % of household members of working age have completed only elementary school, and 46 % have completed secondary education.

Around one tenth of all households surveyed are planning to increase the size of their farm in the next five years. Roughly the same proportion intend to quit agriculture. Factors increasing the likelihood of expansion are a positive view of farm adaptability, good infrastructure links, and current farm size. Farm exit is a more likely prospect if the farm is located comparatively near to a city centre (in this case, Zagreb), and thus there is greater potential to exploit advantageous possibilities of non-agricultural income. Other factors that influence this outcome are: A negative attitude towards agricultural labour, a poor assessment of the future prospects of the farm, and the fact that no subsidies are being handed out at present. The largest proportion of family farms (40 %, including subsidiary and hobby farmers), however, intend in the medium term to take further steps towards diversification into the non-farm sector. Individual career decisions reveal that pluriactivity – the combination of agricultural and non-agricultural work at an individual level – can be seen as the first step away from agriculture; 25 % of pluriactive people intend to focus on non-agricultural work in the medium term. And yet, even if the prevalence of small-scale, often (semi-) subsistence agriculture is slowly going to disappear, developments in Slovenia show that hobby farming can be a significant way of keeping

even the smallest farms alive. Almost 20 % of family farms intend continuing with agricultural activity to produce for their own needs or as subsidiary and hobby farmers. This means that, in the medium term, these farms will only be slightly affected by policy measures introduced to encourage structural change.

The prevailing attitude of Croatian farmers towards the forthcoming EU entry is a negative one. Only a few aspects of accession are deemed positive, such as the hope for improvements in the general area of law and order. The strict EU regulations in agriculture, on the other hand, are seen as a threat to the economic survival of farms. With the opening up of markets, many farmers fear that they will not be able to keep pace with international competition. And yet there is no evidence that these fears are resulting in a greater acceptance of the instruments of the IPA programme (Instrument for Pre-accession Assistance), which is helping finance the very investments needed for adaptation. Judging by the Slovenian experience, however, the predominantly negative opinion towards EU entry is expected to change when the (financial) advantages become known. Part of the reason for the predominantly negative attitude of Croatian farmers, therefore, is a lack of information about the actual consequences of accession.

### **Policy recommendations for the development of the farming sector**

To encourage a balanced development of the rural economy, agri-policy measures, particularly subsidies, should not be the only pillar of public support. This viewpoint is accepted in Croatia, although traditional support measures continue to play a (too) large role. The adverse structure, with a large number

of small farms that have little prospect of being able to survive competition in the future, is one of the chief obstacles to a dynamic development in agriculture. For this reason, structural measures must be at the centre of policy towards the sector. Factor market deficits must be overcome; support for competitive farms as well as incentives for quitting agriculture are of key importance here.

The Croatian land market does not function sufficiently well. A careful continuation of the policy of land consolidation is, therefore, advisable. Labour mobility between sectors is, on the other hand, already a reality. Professional training is a key factor, however, for a successful entry into the non-agricultural labour market. In this respect, all measures that improve access for both children and adults to education and training are to be encouraged. Such opportunities can also counteract the trend for migration from rural areas in the medium and long term. The capital and credit market is another weak aspect of rural development in Croatia, as only few farmers are prepared, or in a position to accept external finance. Further studies still need to be done to ascertain whether this is primarily due to the hesitant attitude of farmers or a lack of investors looking to offer micro-credit. There can be no doubt, however, that the access to credit is an important factor in the process of adaptation.

Farm development should be a priority for full-time farms which, as mentioned above, operate more efficiently than part-time and subsidiary and hobby farms. Only 11 % of family farms have indicated that they are looking to expand in the next five years. This small group of farms should be the priority target group for advice and investment-related measures. The drafting of a realistic business plan, taking into consideration the acceptable level of

risk for the farmer, must be paramount, particularly where credit-financed investments are concerned.

A high overall level of subsidy is undoubtedly one of the aims of the negotiations over EU entry. For Croatia it is important at an early stage to harmonise all subsidies with the EU measures. This also means that, if direct payments are introduced, they ought to be decoupled to a high degree. In Slovenia direct payments have shown themselves to be an appropriate means of income security within agriculture. Compensation payments must, however, always be tied to a clearly defined transition period, as otherwise they impede structural change instead of encouraging it. The same applies to programmes to help farmers exiting agriculture, which might be important for Croatia as only 10 % of those surveyed intend to leave farming in the next five years, in spite of the unfavourable farm structure. By contrast, 45 % want to either keep their farm as it is, or continue as hobby farmers. To ensure effective structural change, however, it is essential that sufficient farmers quit agriculture. Agri-policy measures can provide incentives to persuade farmers to leave the agricultural sector and to offer their land to farms keen on expansion. For precisely this reason it would be important to exclude (semi) subsistence and hobby farms from classic agricultural subsidy programmes. Special conditions relating to early retirement for farmers, as they exist in the EU, or other financial incentives tied to quitting agriculture, might have a positive effect on structural change.

The Croatian agricultural advisory service lacks staff; this must be rectified in order to be able to give effective support to structural change in agriculture. In 2007, 215 advisers (198 of which were specialist agricultural advisers) within the Croatian advisory

service were on hand to assist a potential 448,000 family farms. Each adviser is thus responsible for more than 2,000 farms. It is thus clear that the service needs substantially more specialist advisers in order to fulfil its task. It is also important to educate the advisers about the various investment programmes on offer at both national and EU level, to ensure that interested farmers get sound advice about application procedures, drawing up business plans, and assessing business risks.

### **Policy recommendations for the development of the rural economy**

As mentioned above, rural development affects the whole countryside, not just agriculture. In addition to sectoral measures, therefore, policies must also be implemented which address all aspects of the rural economy. One central issue here is rural employment opportunities. Agriculture can ensure a working future for many inhabitants of the countryside, but by no means for all. All those who wish to diversify into non-agricultural sectors need opportunities in education and vocational training. At 11 %, the proportion of unemployed people in Croatia is high. In combination with the relatively low level of education amongst the agricultural population, this situation makes the transition to non-agricultural work more difficult. Key objectives of Croatian social and labour market policy in rural areas must, therefore, be to increase the employment rate and promote the adaptation of the workforce to the needs of the labour market.

In Croatia, the rural population harbours a sense of uncertainty about the changes that forthcoming EU accession is expected to bring. Education campaigns could both relieve people's fears as well as give specific information about how to adapt effectively

to the requirements of the changing economic environment. In the agricultural sector the advisory services must be closely tied into such projects by instructing them specifically in how to disseminate this information. As rural areas are heterogeneous, general recommendations for sustainable rural development programmes are no longer of any use. Decentralised and participative decision processes are necessary to identify customised policy recommendations for a particular region.

With its attempts to gain entry into the EU, Croatia's position is in many respects similar to that of Slovenia a few years ago. For this reason, as mentioned at the start, interviews were conducted with Slovenian negotiation groups and associated experts, in parallel to the empirical study in Croatia. The Slovenian experience suggests that a well thought-out negotiation strategy, agreed with all parties concerned, is the basis for successful negotiations. The policy aims ought to be clearly defined, and there must be a concrete assessment of the funding requirement for rural development. In laying out the strategy and objectives a coherent statistical database should be consulted wherever possible, and scientific analyses and simulations of possible paths and their effects ought to act as a reference guide. Unanswered questions which crop up in the negotiation process must be addressed in regular consultation sessions.

Based on the Slovenian experience, Croatia should introduce the main parameters of the reformed Common Agricultural Policy (CAP) before the end of negotiations. This would be a signal to the EU that the preparations for entry are far advanced, but also allow Croatia to undergo important experiences prior to accession. Besides the harmonisation of legislation and the adoption of directives and guidelines, the efficient implementation and

harmonisation of institutions and political procedures are also important. It should be emphasised again how crucial it is to enlist the help agricultural advisers from the earliest possible stage for the introduction of CAP measures.

It is also reasonable for Croatia to try to negotiate as high a level of funding as possible for rural development. As far as income security is concerned, one objective could be a rapid adaptation to the EU payment level, as in Slovenia. On the other hand this could soon lead to a conflict of interest with the objectives relating to structural change. The recommendation here, therefore – in contrast to the Slovenian approach – is to focus less on the disadvantaged rural areas, and more on general instruments of regional development.

Members of the **consortium** are: *Ružica Gelo* (Croatian Chamber of Commerce, HGK, Zagreb, Croatia), *Detlev Böttcher* and *Karin Hörhan* (GTZ, Eschborn, Germany/Zagreb, Croatia), *Gertrud Buchenrieder* and *Judith Möllers*, (IAMO, Halle (Saale), Germany), *Ramona Franic* and *Mario Njavro* (University of

Zagreb, Croatia), *Tugomir Majdak* (Ministry of Agriculture, Forestry and Water Management, Zagreb, Croatia), *Borna Domitrovic* (Ministry of Foreign Affairs and European Integration, Zagreb, Croatia), *Štefan Bojnec* (University of Primorska, Slovenia).

#### Further literature

MÖLLERS, J., ZIER, P., FROBERG, K., BUCHENRIEDER, G., BOJNEC, Š. (2009): Croatia's EU accession: Socio-economic assessment of farm households and policy recommendations, *Studies on the Agricultural and Food Sector in Central and Eastern Europe*, Vol. 48, IAMO, Halle (Saale).

MÖLLERS, J., ZIER, P., BUCHENRIEDER, G. (2008): Expectations, strategies and prospects of farmers in view of Croatia's pending EU accession, *International Advances in Economic Research*, 14, pp. 381-394.

FELLMANN, T., MÖLLERS, J. (2009): Structural change in rural Croatia – Is early retirement an option?, *International Advances in Economic Research*, 15, pp. 125-137.

# Institutional obstacles to the multi-purpose use of water in the Bulgarian irrigation sector

*INSA THEESFELD*

In many countries of Central and Eastern Europe the dramatic deterioration of the economic situation during the crisis of transition has meant that, for the past two decades, the agricultural sector has had to take on a number of different tasks outside of production. One of these is the safeguarding of the livelihoods of the older rural population. The agricultural production cooperatives, moreover, have lost their economic clout as well as the capacity to create social cohesion in rural areas.

Bulgarian irrigation systems are a legacy of the planned economy and as such are tailored to the needs of large production units. They have not yet been adapted to new, diverse requirements and the radical change in farm structure. The majority of installations are now obsolete. Water loss from the irrigation systems is estimated at about 70 %. The few remaining water resources for irrigation have to serve diverse purposes in direct competition with each other, e.g. subsistence farming, watering animals, large-scale intensive agriculture, and fish farming. The study behind this article is an analysis, from an institutional perspective, of the regulations drawn up relating to local water extraction and irrigation. There is an investigation of local factors determining the actual regulations in force, which often disadvantage the poorest groups. Of significance here are the consequences of the huge disparity between formal and informal regulations, which encourage opportunistic behaviour and the abuse of power by parties acting solely in their own interests. At the heart of the analysis is the abuse of power as the key factor

which impedes the creation of a level playing field vis-à-vis the various uses of water. By means of a survey of local actors it can be ascertained whether access to information, which varies from group to group, is an important resource of power.

## **1 The case study**

The study is based on six months of empirical field research, divided into three phases over a period of two-and-a-half years from 2000-2002. As part of the investigation, four case studies were carried out in villages in the Haskovo region of south-eastern Bulgaria. The chief source of water for irrigation in southern Bulgaria is surface water stored in reservoirs. The water generally travels to the fields via open canals. In most cases farmers distribute the water across their fields using simple gravity technology. The study relates to two water catchment areas. Two villages were selected for both areas, one located directly behind the dam, and the other further down, either at the centre or the end of the canal and river system.

During the first two research phases an analysis was carried out, using exploratory and qualitative methods, of – besides other aspects – the regulations in force relating to everyday irrigation practice. The empirical work concentrated on those power resources of local actors in the irrigation sector which the actors themselves deemed to be important. In the third empirical phase interactive ranking techniques were used to place these power resources in descending order of importance.



## 2 Multi-purpose water use

Irrigation requirements vary greatly between subsistence farmers and professional agricultural enterprises, depending on farming structure, the size of the plots, and irrigation techniques. In the region where the case studies were carried out, subsistence farmers generally farm less than half a hectare. The professional enterprises include a small number of medium-sized farms, between 3 and 40 ha, on average one or two large tenants and one or two agricultural cooperatives per village, which farm around 300 ha.

There is not enough water in the canal for all users to irrigate at the same time. In any case, the canal system is not branched, so without storage techniques it would be impossible for everybody to water simultaneously. For this reason the subsistence farmers, most of whom farm at the end of the canal, are forced to take less water from the system (OSTROM, 1992). Another particular feature of the infrastructure is that water for livestock raised on a subsistence basis is mostly taken from the river. The watering of farm animals thus leads to the extraction of water volumes from resources that other farmers wish to use for irrigation.

A distinctive feature of the Bulgarian irrigation sector is fish farming in reservoirs. Conflicts often arise between fish breeders and farmers. In summer, i.e. the period when the fish are growing, the water is either kept at a high level for fish farming, or drained for irrigation purposes. In autumn, the water level is either lowered, to empty it of fish, or the water is saved for the following spring. The fish farming business is part of organised crime, which is widespread in Bulgaria. For this reason the micro reservoirs

are guarded, and neither water users nor local authorities are willing to enter into negotiations over the release of water for irrigation purposes (see Fig. 1).

## 3 Local regulations relating to water use

An institutional field analysis requires an understanding of effective regulations, that is to say the regulations that actually influence behaviour. A disparity between formal and effective regulations is typical of transition countries, and is very pronounced in the Bulgarian irrigation sector. The effective regulations relating to water use favour some water users and disadvantage others. Inadequate mechanisms of sanction and implementation, as well as virtually non-existent monitoring mechanisms encourage opportunistic behaviour and lead to inequality of opportunity amongst groups using water for different purposes.

### 3.1 Rights of water provision and extraction

Water users have to submit a request to the irrigation controller of the state irrigation firm, in order to be able to irrigate at a later date. The formal regulations stipulate that the irrigation controller must first receive a certain number of applications before he can open the barrier and fill the canal with water. This regulation is not always followed, however. The *first* formal regulation – a farmer who requests water and pays in advance has the right to irrigate his fields – does not work in practice. The informal rule seems to be: "If the canal is full, then irrigate whether you've applied for water or not, just to be on the safe side." Because of this the irrigation controller tries to collect the fees afterwards.

As far as fish farming is concerned, the formal regulation is that the stock of fish must not be so high that it leads to competition

between fish breeders and farmers. The empirical study revealed, however, that although farmers in one village had submitted a request for water, the tenant of the reservoir did not allow any water drain into the canal.

The state irrigation firm also gives the controllers verbal guidelines about the order of precedence for crops needing irrigation. For example, between 5pm and 8pm only gherkins should be

watered. During the daytime, aubergines, tomatoes and peppers should have priority. Sweetcorn is ranked third as it needs a lot of water. It should mainly be irrigated late at night. It must be noted, however, that in most cases irrigation practice does not correspond with these guidelines.

A statement made during one of the interviews sums up the *second* regulation applying to the order in which irrigation takes place:

**Figure 1:** *Fish farming in a micro reservoir*



*Note: The sign reads: "No fishing". On the bank behind is the security guard's hut.*

"Whoever has their land right at the beginning of the canal is the first person to irrigate. That's the law." Most of those surveyed described the situation as chaotic. If the canal is full the farmer at the end of the canal will be short of water, even if he has already paid for it, because everybody else will have irrigated before him (see Fig. 2). For the most part, subsistence farmers can only lease small plots at the end of canals from cooperatives or large tenants, which means they are disadvantaged by the discrepancy between formal and effective regulations relating to water extraction (THEESFELD, 2004).

The *third* effective irrigation regulation for a canal is the dominance of physical power, Direct violence between users of an irrigation system is symptomatic of an inadequate allotment to users of temporal and spatial irrigation units (OSTROM, 1992).

### 3.2 Monitoring the system

There is virtually no official system for policing water extraction. The result of this is that farmers are watching their fields round the clock. In part farmers are waiting for the water in the canal to reach their fields so that they can begin irrigating immediately before another farmer starts to water. They also have to monitor the canal during irrigation, otherwise another farmer might draw off water from a better (top-end) position on the canal, leaving too little water for their own use (THEESFELD, 2004).

### 3.3. Exclusion and sanctions

Water users who have paid no fee for their water cannot technically be excluded from water distribution from the canal. No sound or credible sanction mechanism exists, such as that described by OSTROM (1992) in his draft principles for stable institutions

of self-administration of resources used in common. A formal power of sanction is mostly lacking. If the irrigation controller has no authority either, as is the case in one village in the case study, people who are caught breaking the law, e.g. by destroying a barrage, cannot be punished.



*Home-made barrier for water retention.*

*Note: This barrier allows no water to pass through, which means that the rest of the canal remains dry.*

#### 4 Abuse of power in the irrigation sector

The examples given above of actual water extraction practice suggest that the incompatibility between formal and effective regulation is not only a result of local power imbalances, but that it exacerbates the existing power asymmetries even further. Asymmetries in the provision of power resources influence most decisions and behaviour in the irrigation sector (THEESFELD, 2004). Table 1 shows examples of transactions in the irrigation sector which are characterised by the abuse of power. The essence of the Distributional Theory of Institutional Change (KNIGHT, 1992) is that power asymmetries are the main factor which bring about institutional change. This theory helps explain how asymmetries in the capacities of strategic actors ultimately influence how rules come into being.

The third research phase of the case studies focused on those power resources of local actors which lead to power asymmetries. There was an interactive ranking system of the power resources as perceived by those surveyed. The empirical findings are statistically significant: They show that the territorial, social, or agricultural groupings to which those questioned belonged was irrelevant in the citing and ranking of power resources. Overall, the people surveyed ranked power resources as follows: (1) Access to information was seen as most important, followed by (2) personal relations, (3) trustworthiness, (4) bribery money, (5) threats, and (6) physical violence. Thus for the interviewees, access to information was deemed to be the most important power resource.

#### 5 Conclusion and future prospects

It has become clear that the introduction of new formal regulations, such as the 2001 Water User Association Law, has ignored – and even encouraged – the power imbalances at local level and the abuse of power by individual actors seeking to gain personal advantage (THEESFELD, 2004). To enable equal access to water for all actors, power asymmetries within the new, diverse constellation of actors by the canal must be reduced. Effective regulation is needed which allows the provision of water for a wide range of different, even competing uses. There must be support for the development of regulation and governance structures which enable disadvantaged groups to use water on the basis of equality and for diverse purposes. Local actors' own assessment about the importance of various power resources can be a starting point and an indicator for specific policy measures. Thus the finding that access to information is deemed the most important influence might lead to the following measures: An expansion of the advisory service would keep farmers better informed and encourage communication between them; while an agricultural newspaper would be an easily accessible medium for the dissemination of information, as not all farmers have access to the Internet. The current web site of the Ministry of Agriculture and Forestry does, however, offer a good basis for the publication of general statistical data, and for the stimulation of debate about the legislative process.

## Further literature

KNIGHT, J. (1992): *Institutions and Social Conflict*, Washington University: Cambridge University Press.

OSTROM, E. (1992): *Crafting Institutions for Self-Governance Irrigation Systems*, San Francisco: Institute for Contemporary Studies Press.

THEESFELD, I. (2004): Constraints on collective action in a transitional economy: The case of Bulgaria's irrigation sector, *World Development*, 32 (2), pp. 251-71.

THEESFELD, I. (2008): Irrigation sector in Bulgaria: Impact of post-socialist policy reforms, *Water Policy*, 10, pp. 375-89.

**Table 1: Transactions in the irrigation sector affected by the abuse of power**

Transactions in the irrigation sector	Actors involved	Specific decisions affected by abuse of power
Leasing of cooperative land	Water user ↔ Cooperative	Who gets the land at the top end of the canal?
Starting irrigation	Water user ↔ Neighbouring water user at the canal	Who waters first? Who violates the allocation scheme?
Letting water into the canal	Water user ↔ Controller	When does this happen, to whose advantage?
Closing the barrier of a micro reservoir	Fish farmer ↔ Water user	For how long will no water be allowed into the canal?

Source: Own calculations.



# Sectoral migration of the workforce in transition economies

THOMAS HERZFELD, THOMAS GLAUBEN

## Introduction

In most cases, economic reforms in the countries of Central and Eastern Europe and in Eastern Asia have involved a fundamental restructuring of the parameters of the agricultural sector. In the first few years of economic reforms many countries implemented privatisation measures. Collective farms and agricultural enterprises in state ownership were dissolved, and their means of production were redistributed in a variety of ways depending on the individual country. ROZELLE and SWINNEN (2004) provide a comprehensive survey of these different procedures. Although agricultural production dropped in almost all countries after the start of the first reforms, employment in the agricultural sector has exhibited a more pronouncedly heterogeneous development.

Figure 1 illustrates the relative change in employment in agriculture and forestry since the start of reforms. Based on an index of agricultural liberalisation, almost all countries can be classified in three groups depending on whether the implementation of reforms was rapid, medium-paced, or slow. No comparable indicator has been calculated for the three Asian transition countries, China, Mongolia and Vietnam. The last two columns show, by comparison, the development in the five new states of Germany (the former GDR) and the countries of the EU 12.

It is clear to see that it is mainly those countries where reforms were implemented quickly that display a high level of migration away from agriculture and forestry. Thus in Estonia, Czech Republic, Hungary and Slovakia, employment in these sectors

fell to below half that prior to the start of economic reforms. A similar pattern can also be seen in the former East Germany. Belarus is the only country with slow economic reforms to show an analogous development. In some other countries, by contrast, the agricultural sector has grown. Armenia and Georgia have even seen a doubling of the original employment levels in agriculture. As far as both China and Vietnam are concerned, it must be noted that the substantial falls in agricultural employment (by 40 % and 20 % respectively) relate to much longer time-periods: 27 and 24 years respectively.

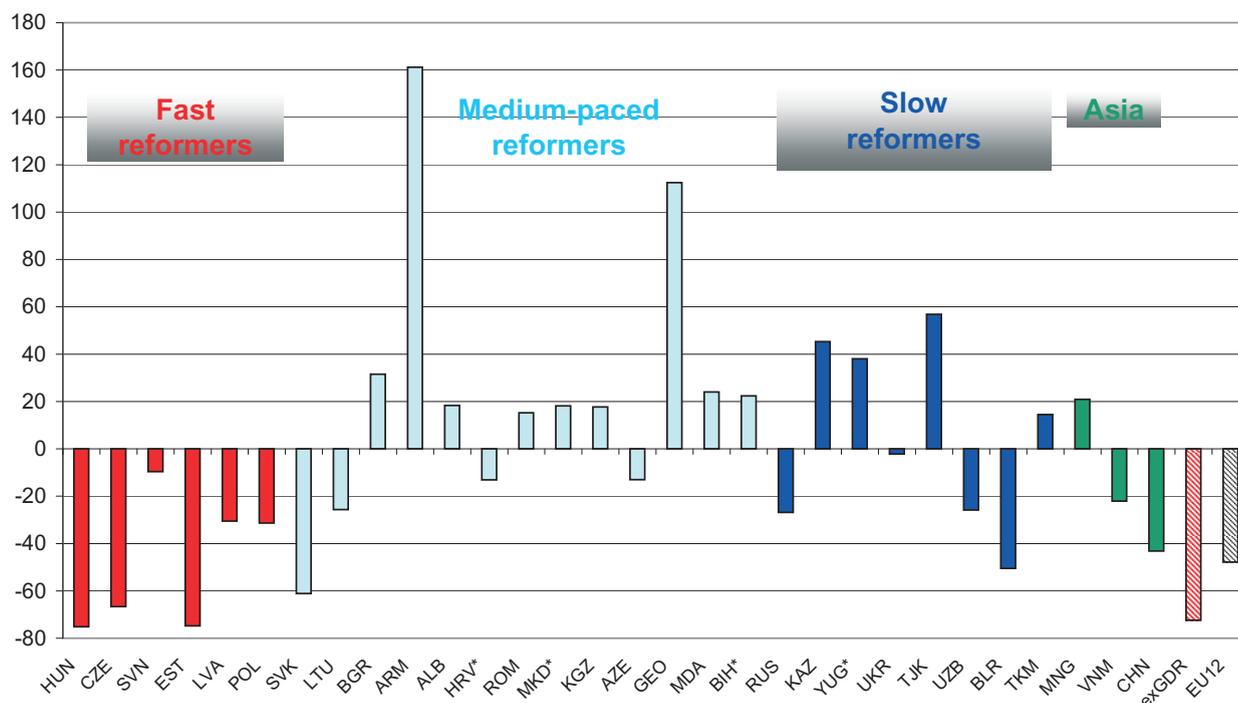
This paper is based on an ongoing study into workforce mobility between sectors of the economy in 30 transition countries of Europe and Asia, to explain the heterogeneous development of agricultural employment. There will be a comparison of sectoral change from an employment perspective and an examination of possible determinants within an econometric analysis.

The article seeks to discover the factors have driven or decelerated sectoral change. The analysis is based on annual data relating to sectoral employment and production in transition countries over the last three decades.

## From the average to annual changes

To simplify this analysis each economy is divided into an agricultural and a non-agricultural sector. The difference in employment growth rates in the two sectors represents an

**Figure 1: Percentile change in the proportion of people employed in agriculture**



Source: Own calculations based on data from the *WORLD BANK* (2007), *ILO* (2007), *FAO* (2007) and national statistics.

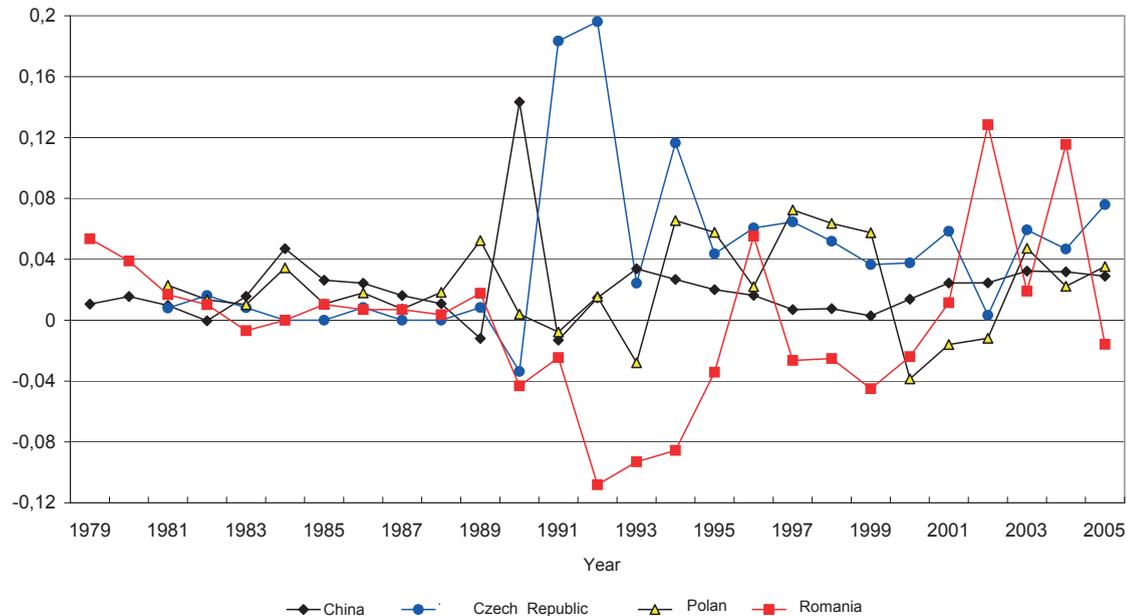
Notes: Relative change between 1989 and 2005 for all countries of Central and Eastern Europe, 1990-2005 for all countries of the former Soviet Union and Mongolia, except: Bosnia and Herzegovina (1999-2005), China (1978-2005), Croatia (1996-2005), Macedonia (1991-2005), Serbia and Montenegro (1996-2005), Turkmenistan (1990-2005), and Vietnam (1981-2005). (HUN = Hungary, CZE = Czech Republic, SVN = Slovenia, EST = Estonia, LVA = Latvia, POL = Poland, SVK = Slovakia, LTU = Lithuania, BGR = Bulgaria, ARM = Armenia, ALB = Albania, HRV = Croatia, ROM = Romania, MKD = Macedonia, KGZ = Kyrgyzstan, AZE = Azerbaijan, GEO = Georgia, MDA = Moldova, BIH = Bosnia and Herzegovina, RUS = Russia, KAZ = Kazakhstan, YUG = Serbia and Montenegro, UKR = Ukraine, TJK = Tajikistan, UZB = Uzbekistan, BLR = Belarus, TKM = Turkmenistan, MNG = Mongolia, VNM = Vietnam, CHN = China, exGDR = former East Germany).

appropriate measurement for registering the annual migration of the workforce between sectors in an economy. This difference expresses a relative measurement compared to employment rates in agriculture and forestry for the previous year. Assuming a constant growth in employment throughout the economy overall, a positive difference in sectoral growth rates represents a migration away from agriculture. Conversely, a negative difference indicates a higher rate of growth within the agricultural sector compared to the non-agricultural sector. This indicator is described below as inter-sectoral migration.

Figure 2 shows the annual inter-sectoral migration rates for four countries. All four graphs point to very different patterns of workforce migration in the individual transition countries.

As mentioned above, migration from the agricultural sector in China is spread out over almost 30 years, fluctuating per year between 4.0 % and 0.3 % of agricultural employment. The years 1989-91 are an exception, and suggest either mistakes in the measuring process or a change in official statistics. In many publications China is presented as a prominent example of a relatively slow implementation of reforms. The constant migration from agriculture may have been a result of former agricultural producers taking main jobs outside farming or of stronger growth in non-agricultural sectors of the economy. The Czech Republic and the Czech part of the former Czechoslovakia show a totally different development. During the 1980s there was scarcely any migration from the agricultural sector. With the

**Figure 2: Migration rate (in % of agricultural employment)**



Source: Own calculations.

beginning of political and economic reforms, agriculture saw a short-term (relative) influx of almost 4 %, followed by a high level of emigration between 18 and 20 % in the two years after that (1992-93). The restructuring and dissolution of production co-operatives were accompanied by a large number of redundancies, which explains the rapid decrease in agricultural employment. It was only in later years that decisions by newcomers to enter the sector caused the trend in agricultural employment to fluctuate. A similar development can be seen in Estonia and in the territory of the former East Germany.

A striking contrast to this is the relatively high level of growth in agricultural employment in Romania between 1991 and 1996. In this instance the agricultural sector acted as an insurance against economic instability and unemployment. Poland, whose agriculture was to a large extent uncollectivised, displayed a comparatively high level of migration from the agricultural sector even before the start of economic reforms. It was only after 1995, however, that this figure climbed to over 5 %

### **Determinants of sectoral workforce migration**

Theoretical studies seeking to explain countryside-city migration attach great significance to the difference in income between the agricultural and non-agricultural sectors. Assuming a free choice of profession and place of residence, no restrictions based on different levels of education, and the willingness of employees to take on new jobs, neo-classical economic theory predicts a harmonisation of income in both sectors. If this does not occur, then obstacles to the choice of employment seem to be present. As there is only limited data relating to wages and non-monetary payments, and none at all for the self-employed, personal incomes

cannot be compared. Following other studies, this analysis uses the value of all goods and services produced per employee as an indicator of income. This provides an average income level for the two sectors. In 16 of the 30 transition countries under investigation, the approximated income outside agriculture is twice that of agricultural income. Especially in Tajikistan, but also in China, Vietnam and Mongolia, the average value of production per worker in the non-agricultural sector is more than four times that in agriculture and forestry. By international standards these are relatively high discrepancies and suggest the existence of barriers to inter-sectoral mobility. Roughly three times average agricultural income is obtained in the non-agricultural sectors of Bulgaria, Poland, Georgia, Turkmenistan, Slovenia, Croatia and Macedonia. Figure 3 illustrates the relationship between average sectoral incomes in the year prior to reforms (light columns) and 2005 (dark columns) for each of the 30 transition countries. Where the relevant data exists, the countries are divided into three groups relating to the index of agricultural liberalisation, as in Figure 1.

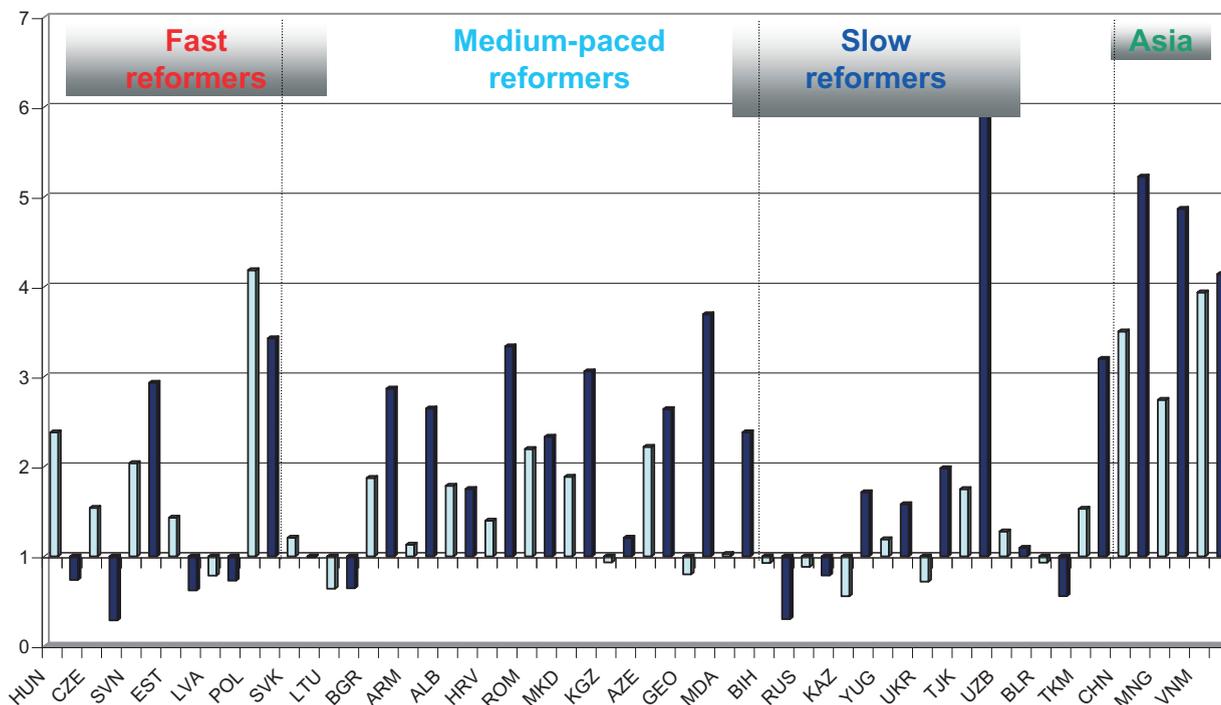
A further stage of the study has used a panel data analysis to examine determinants of intersectoral migration for the period in question and for all 30 transition countries. These determinants include both macro-economic and polit-economic factors. Below is an outline of the most influential determinants, with the analysis having been restricted to the years following the start of economic reforms.

The level of sectoral income discrepancy described above has a substantial influence on the migration rate. When the income relationship rises from 1 to 2 to agriculture's disadvantage, the annual migration rate increases by 1.1 %. If we limit our focus to

the ten new EU members amongst the transition countries then the influence of these variables is even stronger. This means that workers in these countries react more sharply to intersectoral differences in income than in the former Soviet Union, for example. Conversely, an improvement of the relationship between product and factor prices or the agricultural terms of trade reduces the urge for migration. In other words, increases

in prices for agricultural products slow down the change in sectoral employment, all other things being equal. It is expected that a greater rise in prices for intermediate goods, on the other hand, will accelerate migration. Ultimately we can say the following about migration: (a) where the agricultural sector is of comparable importance, more workers migrate away from agriculture in relatively richer countries, and (b) countries where the

**Figure 3: Relationship of average non-agricultural/agricultural incomes per employed person in 1989/90 and 2005**



Source: Own calculations.

Note: Intersectoral relationship of incomes in 1989 and 2005 for all countries of Central and Eastern Europe, 1990 and 2005 for all countries of the former Soviet Union, former Yugoslavia and Mongolia. Exceptions are China (1978-2005), Croatia (1992-2005), Macedonia (1991-2005), Turkmenistan (1990-2004) and Vietnam (1981-2005).

agricultural sector is of greater importance have higher levels of migration. In the latter case, sectoral change slows down as the proportion of people employed in agriculture and forestry falls.

### **Conclusion**

The findings of the study point to some important conclusions. Sectoral workforce migration has taken very different paths in the individual transition countries, ranging from a very rapid drop in agricultural employment, via a constant and relatively slow migration, to an influx of workers into the agricultural sector. The results of the econometric analysis show the major influence of income disparities between sectors as determinants of migration. Relative changes in average incomes in favour of non-agricultural sectors increase the incentive to leave agriculture. Where institutional barriers to workforce mobility add to disparities, there is greater pressure to implement institutional reforms. Based on this finding it is clear that the very high intersectoral differences in income in Tajikistan, China, Mongolia and Vietnam require a more detailed analysis to ascertain their possible causes. Conversely, a positive development of relative

agricultural prices reduces the incentive to migrate from agriculture. This finding highlights that political interventions into product or factor markets in the form of taxation, subsidies or tariffs also indirectly affect labour markets. Finally, policymaking must take into consideration that countries with a relatively high proportion of their workforce in agriculture tend to experience more rapid structural change, although intersectoral workforce migration declines as agriculture becomes a less important employer.

### **Further literature**

FAO (2007): FAOStat, Food and Agriculture Organisation of the United Nations, Rome.

ILO (2007): Laborsta Internet, International Labour Office, Geneva.

ROZELLE, S., SWINNEN, J. (2004): Success and failure of reform: Insights from the transition of agriculture, *Journal of Economic Literature*, 42, pp. 404-456.

WORLD BANK (2007): World Development Indicators, CD-ROM, Washington.

## Global challenges for the agricultural and food economy: Findings of the 2008 IAMO Forum

*THOMAS GLAUBEN, JON HANF, MICHAEL KOPSIDIS, AGATA PIENIADZ, KLAUS REINSBERG*

In the midst of globalisation, increasing energy shortages and rising demands for combating poverty, the agricultural and food economy around the world is facing new challenges. The goal of the 2008 IAMO Forum, which took place from 25-27 June 2008 in Halle (Saale) with the title "Agri-Food Business: Global Challenges – Innovative Solutions", was to discuss innovative strategies and come up with possible solutions. The first day was devoted to the exchange of scientific ideas, whereas the second offered a discussion forum for representatives from the academic, political and business communities. More than 170 participants from more than 20 countries took part in the Forum. The 2008 IAMO Forum was rounded off with a one-day study trip. Most of the academics were from transition countries and emerging nations. For the first time the participants at the IAMO Forum included a sizeable group of Chinese researchers. Most participants were promising young academics, for whom the conference offered an internationally recognised platform for the discussion of their research findings.

The Forum succeeded in attracting renowned academics and managers from international organisations for the two plenary sessions, "Quality" and "Bioenergy". The main speakers from the scientific world were: Prof. Dr Spencer J. Henson from the University of Guelph in Canada; Prof. Dr Alois Heißenhuber from the Technical University in Munich; and the former Dutch Minister of Agriculture and President of the EU Council of Ministers,

Prof. Dr Cees P. Veerman of the University of Wageningen. Other speakers were: Dr Keith Wiebe, head of the FAO's "Comparative Agricultural Development Service"; Dr Christian Patemann, former programme director of "Biotechnology, Agriculture and Food" in the European Commission's Research Directorate-General; and Dr Torsten Gabriel from the Agency for Renewable Resources e.V. (FNR). In addition to the main lectures, 30 selected papers were delivered and discussed in nine sessions over two days. There was also a session with guest experts on the topic of agroholdings, in which three papers were given by, amongst others, Prof. Dr Dmitri Rylko from the "Institute of Agricultural Market Studies" (IKAR) in Moscow, and Dr Alexej Lissitsa from the "Ukrainian Business Club" in Kiev. A special session was held in honour of Prof. Dr Klaus Froberg with two invited speakers: Prof. Dr Csaba Csáki and Prof. Dr Gerhard Schiefer. Complementing the lectures were two sessions with 41 poster presentations.

The outline lectures and individual papers, as well as the intensive discussions focused on three topics: "Food quality and sustainability", "Bioenergy" and "Redefinition of agricultural policy". There was intensive debate about development deficits and the structural change necessary in the agricultural and food economy of Central and Eastern Europe and China in the face of globalisation. The discussion of current research findings in the dialogue between research and practice highlighted possible



*Prof. Dr Stephan von Cramon-Taubadel (l.), Prof. Dr Spencer J. Henson (r.) on the podium at the 2008 IAMO Forum*

future ways of harmonising strategies of energy supply based on renewable resources with the goal of global food security, and of dealing with the increasing competition for land between food and bioenergy production. Another important finding of the discussions is that the demand for higher food standards across the globe, as a key element of increasing food safety, is closely connected with the participation of transition and developing countries in world trade, and issues of income security in these nations. Open global agricultural markets would substantially improve the prospects for development of poor countries in particular.

Three of the main speakers at the first plenary session – Keith Wiebe of the FAO, Spencer J. Henson of the University of Guelph and Cees P. Veermann of the University of Wageningen – looked at the topic of "Food quality and sustainability" from very different perspectives. They gave an overview of the most important trends in global agricultural markets, from the perspective of developing countries and that of emerging and established industrialised nations. Whereas the poorest countries are most affected by growing problems of food security, in emerging nations and transition countries it is food quality that is a key issue. According to Keith Weibe and Cees P. Veerman, an agricultural policy focused on food security is hampered particularly in the poorest countries by worsening environmental conditions in the course of climate change, and by developments on the global market. Although there is sufficient food around the world, the global problem of distribution has been exacerbated in particular by the bioenergy boom and agricultural protectionism in industrialised nations. Unlike in the past, development policy for the poorest countries must give top priority to agriculture and the much-neglected rural areas. The

most important factors for food security are a sustainable increase in agricultural production while maintaining small-scale agriculture.

Besides food security, food quality is becoming ever more important throughout the world. At present this is chiefly manifesting itself in the growing significance of international private and cross-sector standards for foodstuffs, for which, according to Spencer J. Henson, "the increasing global activity of retailers is responsible". Particularly in emerging nations and transition countries, a broad-based, Western-oriented middle class is developing rapidly, which is placing ever higher demands on food quality. Increasing consumer sovereignty is an important driving force behind the market-oriented behaviour of all actors in the value chains, and helps bring about effective structural change in many transition countries. Developing countries ought to exploit this trend as an opportunity as, according to Spencer, with open markets they can benefit from high quality standards, as the example of Kenya spectacularly shows. These effects will not become widespread, however, until the Doha Round succeeds in making industrialised countries abolish agricultural protectionism.

The plenary lectures on the second day dealt with the topic of bioenergy. It became clear that there is still a considerable need for research into the effects of agrarian policy measures on climate change. Key questions relating to the shaping of sustainable economic and environmental policy measures remain to be answered, and there is still a great need for action. Alois Heißenhuber from Munich Technical University, and a member of the scientific advisory board of the BMELV (German Ministry for Food, Agriculture and Consumer Protection), pointed out

that, according to the scientific advisory board's report, there is reason to be critical of the current support for bioenergy. The German government's massive subsidy policy is insufficiently targeted, and it also supports inefficient forms of energy capture from renewable resources. In its current form it would only lead to a further distortion of the markets, and would continue to drive competition for land between food and energy production. The opposing view was voiced by Torsten Gabriel, also an

expert in bioenergy and head of communications at the Agency for Renewable Resources: "Without a substantial expansion of bioenergy, it will be almost impossible to meet the global energy requirements of the future." Most of the experts present were agreed that the increasing use of farmland for bioenergy crops is putting pressure on food prices, without making a significant contribution to energy security. Second- and third-generation bioenergy technologies, however, which are based on waste,



*Participants at the 2008 IAMO Forum during the poster presentation*

cellulose and more intelligent technology, might be able to mitigate the competition for farmland between food and energy crops, and thus make an important contribution to solving the problem.

Christian Patermann, a former programme director of "Biotechnology, Agriculture and Food" in the European Commission's Research Directorate-General, gave a convincing presentation of the bright prospects of European research in this area.

For the first time at the IAMO Forum a "Best Paper Award" was given for the best paper as well as the best poster presentation. The winners of the "Paper Award" were Thijs Vandermoortele and Prof. Dr Johan F. M. Swinnen of the Leuven Catholic University (Belgium) for their paper "The political economy of nutrition and health standards in food markets". The "Poster Award" went to Prof. Dr Tamás Mizik of Corvinus University in Budapest (Hungary) for his presentation "Bioethanol: The new tool of surviving?" The "Best Paper Award" winners, Swinnen and Vandermoortele, developed in their paper a general model for resolving the important question of which cases saw the presence of "over-standardisation", and which "under-standardisation". Applying both a social and political utility function of the government, they worked out the differences in the optimal standardisation level between high-income industrialised nations and low-income developing countries. One of their most significant findings is that the politically optimal standardisation level derived from the utility function of the government increases with the level of development, without the level of "over-standardisation" necessarily increasing too. Overall, the findings of the various case studies and papers on the important topic of standardisation and certification reveal that the introduction of standards is not in itself automatically beneficial, especially not

for small farmers in transition and developing countries, but requires the assistance of retail chains and/or public programmes of support. An important discovery, which would facilitate the establishment of private standards in spite of all the difficulties associated with their introduction, is that those involved generally behave more honestly than predicted by purely neo-classical models.



*Xi Chen, participant at the 2008 IAMO Forum*

In transition countries, too, there is scope for the establishment of private standards to guarantee food security. A prerequisite for this, however, is a stable framework of the rule of law in a fully developed free-market system.

The papers on the topic "Competition" highlighted that the Eastern expansion of the EU has already paid dividends for the agricultural and food economies of the new EU accession countries. The profitability of the food industry of Central Europe no longer trails behind that of its Western neighbours.

In agricultural foreign trade the export structure of the 12 new EU Member States has already shifted considerably, away from purely raw products to processed products with a high level of added value. The harmonisation of the EU's agricultural and trade policy in the course of enlargement, gradual trade liberalisation, and extensive direct investment in the food industry can be seen as causes for this development. All fears that the food industry and agriculture of Central Europe would not be able to cope with the stiffer competition after enlargement have more or less proved themselves to be false. On the contrary, for the new accession countries Eastern expansion is associated with a substantial growth spurt in agri-business.

The studies on China, chaired by the President of the Chinese Economists Society, Jack Hou, showed that the development

towards becoming a "Global Consumer", oriented towards the middle classes of the Western world, is already very far advanced. At least in the Chinese cities that are booming, globally active retailers are already encountering "European" problems. An example of this is that the requirement to label genetically modified products is leading to low-level, but still statistically significant sales declines, especially amongst wealthier consumer groups. China still is a long way behind in issues relating to food safety, however. An increased opening of the global market and the high standards of Western, globally active retailers is putting considerable pressure for modernisation on China's deficient food controls.

All papers can be accessed online at <<http://www.iamo.de/forum0/forum2008/program/detailed-conference-program.html>>. The nine best papers identified by a multi-stage assessment process have appeared in 2009 as a special issue of the international journal "Outlook on Agriculture". More information on the special issue can be found online at <<http://www.iamo.de/forum0/forum2008/publications.html>>. A further twelve papers, also selected by assessment and thoroughly revised, have already appeared as a printed volume in the Institute's own series *Studies on the Agricultural and Food Sector in Central and Eastern Europe*, which is also available online at <<http://www.iamo.de/iamo/publikationen/studies-reihe.html>>.

# Fuzzy logic and income diversification of farming households: Ideas for a new methodological approach

JANA FRITZSCH, GERTRUD BUCHENRIEDER

## Introduction

Anybody who has carried out empirical research will have experienced the situation where the information they have obtained from interviewees is imperfect. The shortcomings can take a wide variety of forms. The most obvious flaws are those where the interviewee does not know the precise answer to the question, but gives an answer nonetheless. Information that an interviewee offers about a member of the household who is not present can also be defective. Much more delicate are those flawed responses which are given when the interviewee does not wish to answer the question truthfully. The following hypothetical conversation represents a typical situation:

*Interviewer: I'd like to know something about your household income. You said you've got a car, and that you occasionally use it to drive your neighbours around. Could you tell me how much money this earns you on average per year?*

*Interviewee: I don't always ask for money. Sometimes I just take what's offered me. I don't really see my driving as a business, and it doesn't give me an income as such.*

*Interviewer: Yes, I understand. But how much do you get roughly each month for helping your neighbours out.*

*Interviewee: Well, last month wasn't great.*

*Interviewer: So what's a bad month?*

*Interviewee: OK, I got ten units.*

Of course the respondent in this hypothetical interview knows how much he earns with his unofficial taxi business, but he does not want to give any detailed figures. The answer "ten units" is clearly imprecise, but the interviewer has no other choice than to record it. These kind of problematic answers are typical, and always to be expected whenever the sensitive issue of income is touched upon. In this instance the defective data mean that the information relating to income is distorted.

Answers to qualitative questions with predefined categories such as "very good" or "large" are also imperfect data. But whereas in the first two examples the shortcomings result from a lack of knowledge or incorrect information, qualitative answers are flawed from the outset because each individual understands something different by "very good" or "large". Usually these answers are given a numerical rating to enable them to be processed statistically. The resulting values give the misleading impression that these are precise figures. And yet qualitative questions are very popular in questionnaires because they are easier for those surveyed to answer. With this sort of question people do not lose interest or in the survey so quickly and do not feel as if it is too much of an effort.

Despite the flaws in answers outlined above, data collected in this way are used in econometric and simulation models as



if they were precise data, and principles are inferred from the results of analyses. It is true that this approach has produced good findings in recent decades, but it would be appealing and rewarding to use a method which already allows for the vagueness of data during the analysis itself. Such a method is based on fuzzy logic.

### **Fuzzy logic and farming households: On new methodological ground**

With his seminal article "*Fuzzy sets*", LOFTI A. ZADEH founded *fuzzy set theory* in 1965. His theory opened up the possibility of analysing vague data in precise data-processing routines. This solved a lot of problems which engineers had previously faced with complex systems. Fuzzy logic rapidly became important in measurement and control technology, and in expert systems (SIVANANDAM et al., 2007). SMITHSON and VERKULEN (2006) provide an overview of the application of fuzzy logic in the social sciences. The dissertation by REYS (2003) is cited as the standard work for applications in agricultural economics. There is still no known fuzzy logic model, however, that illustrates the decision of a farming household to expand its income sources into non-agricultural activities. This article will set out some preliminary ideas about how such a model could be constructed.

The basic idea behind fuzzy logic is that vague data cannot be seen as true or false, but that they are partly true and partly false. Classical set theory only looks at true and false statements and works with so-called "crisp sets". We talk of crisp sets when each piece of data "belongs" to exactly one set only. For example, the statement that a road is in good condition would mean that this road "belongs" 100% in the subset "good" of all possible subsets

of road conditions. To process vague data, on the other hand, it is only necessary for a statement to "belong" to a set to a certain degree, i.e. for it to be only true to a certain degree. This results in fuzzy sets, which permit the statement on the condition of the road to "belong" 80% to the subset "good", 10% to the subset "fair", and 10% to the subset "very good".

The degree to which a statement "belongs" to a set is determined by the so-called membership functions. These membership functions are at the heart of fuzzy set theory, and defining them is one of the most challenging tasks when developing a fuzzy logic system. Fuzzy sets are interconnected by mathematical operations. The result of the operations is a precise statement. Although much reference has been made above to vagueness and imprecision, it must be emphasised here that it is not the method which is imprecise, but the data which it processes. The method itself is rooted in precise mathematical approaches.

### **The model**

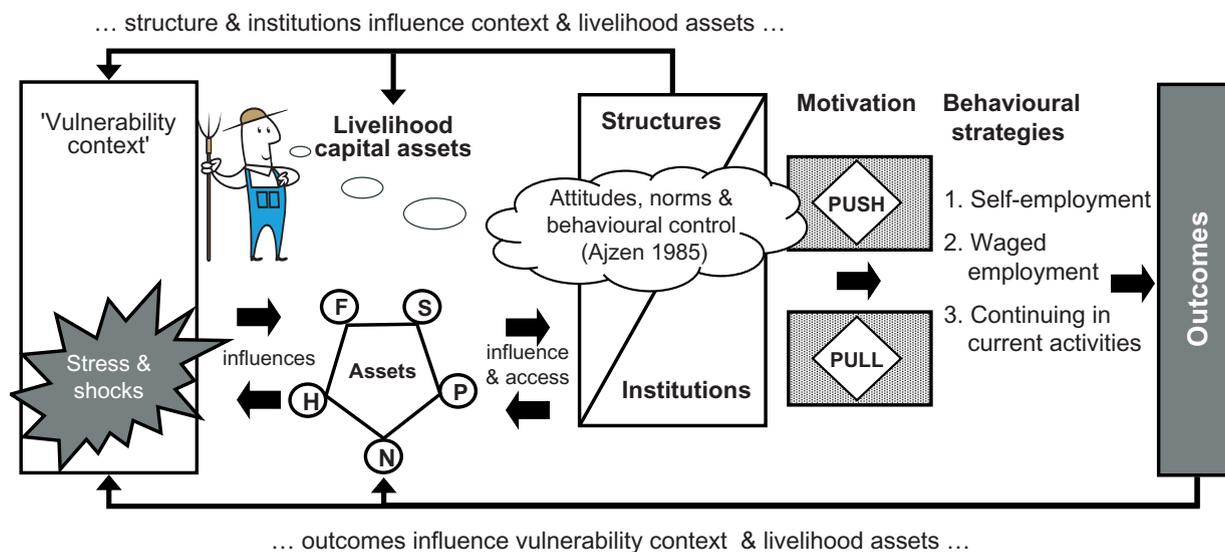
Many authors discuss income diversification in the theoretical context of the *Sustainable Livelihood Framework* (SLF) and the so-called "*demand-pull*" and "*distress-push*" concept (EFSTRATOGLOU, 1990; BARRETT et al., 2001; BUCHENRIEDER, 2005). As neither approach explains the actual decision made by a household to diversify, MÖLLERS (2006) supplemented her theoretical model with the Theory of Planned Behaviour (AJZEN, 1985), and proposed the behaviour model illustrated in Figure 1 for use in analyses. This behaviour model is too large, however, to be converted into a fuzzy logic model that is being developed from scratch. It is nonetheless possible to select the variables for the model in such a way that all aspects of the theories contained in the behaviour model receive consideration.

In the fuzzy logic model devised here, ten variables determine the potential of a household to diversify into non-agricultural income. To make the structure of the model easily understandable, these ten variables were assigned to the following four categories: (i) Need for diversification, (ii) Internal preconditions, (iii) External preconditions, and (iv) Attitudes (Figure 2).

The need to diversify is a "distress-push" factor. It depends on the level of income that a household can earn with its agricultural business and the number of household members who have to live off this income. Households with a high level of agricultural income and few household members dependent on this income have a lower need to seek additional, non-agricultural income

sources in order to cover their household expenditure. The farm size is used in the model as an indicator for the agricultural income that a household can generate. In the SLF, farm size, measured by available land, represents the stock of natural assets. The second variable in the model determining the need of a household to diversify is the dependency ratio. This assumes that it is not primarily the number of household members which causes a household to develop additional income sources, but the ratio of dependent household members to economically active ones. Economically active household members can migrate and look after themselves, whereas children and sometimes pensioners do not have this opportunity and so must be supported by those able to work.

**Figure 1: Behaviour model for the analysis of non-agricultural income diversification**



Source: BUCHENRIEDER (2003, p. 675); MÖLLERS (2006, p. 78), with own adjustments.

One of the internal preconditions governing whether a household is able to diversify is human capital. Internal preconditions work like a switch that determines whether the environment works as a "demand-pull" or "distress-push" situation for the household, because they determine whether a household can exploit advantageous opportunities to earn a higher level of income, or whether it is only the low-wage sector which is open to household members. What is more, there is no doubt that older people are less inclined to change their living circumstances. But even if they did have the intention of taking up paid employment, they would be faced with a labour market unfavourable for older people. Age is not the only limiting factor, however, as people with an inadequate education will also find it difficult to find a job or become self-employed. Finally, the labour capacity of a household also determines its ability to earn additional income. Households with small children, for example, or relatives in need of care, must have at least two economically active persons in order to be able to pursue income diversity. In the model, therefore, the variables age, education and labour capacity determine the internal preconditions of a household for income diversification.

The category of external preconditions determines the opportunity of diversification. It brings together variables which characterise a "demand-pull" situation for the household. The labour market is part of the institutional framework in which a household acts. Remoteness is partly a result of poor infrastructure. In the SLF, infrastructure is part of physical capital. The key question determining the external preconditions is whether there is a demand for paid labour or additional products in the region. For this reason, the labour market situation is used as

another indicator, besides the remoteness of the household, to determine the chances of taking up paid employment. The local demand for new products or services can be measured by regional purchasing power.

But even if the household feels the needs to generate an additional income, and the internal and external preconditions make this possible, the actual behaviour of the household is still dependent on so-called socio-psychological factors. Is there a culture of entrepreneurship, or is it the civil servant who is admired? What will the patriarch of the household say if his granddaughter wants to move to the city? How will the neighbours react if somebody earns more money than they do? This is a broad field. It is not necessary, however, for the fuzzy logic model presented here to address these questions individually; rather it is assumed that all these factors and their effects are reflected in an opinion towards a certain activity. The psychological aspects of the decision to diversify are dealt with in the model by the category "opinions". As attitudes towards self-employment can be diametrically opposed to those towards paid employment, both attitude variables are included in the model. All four categories in their various forms and combinations give the potential of a household to exploit additional sources of income.

### **Future research**

The model displayed in Figure 2 will be implemented as a Mamdani Fuzzy Interference System (MAMDANI and ASSILIAN, 1975), using fuzzyTECH software. The membership functions and rules which link individual fuzzy subsets will be set using the project team's expert knowledge. When the model has been

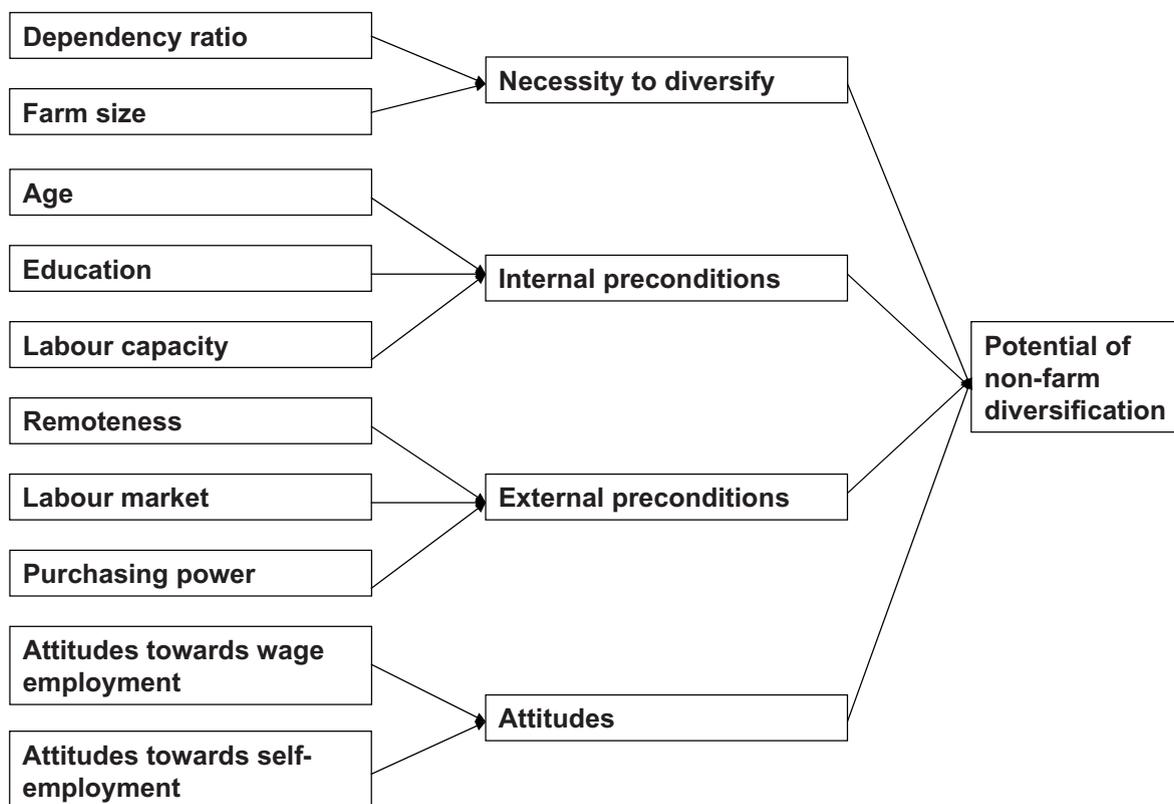
implemented, it will be tested using data from household farm surveys in Poland, Hungary, Slovenia, Romania and Bulgaria. The degree to which the observed behaviour of households is in accordance with the simulated potential for diversification will act as a quality criterion for the model.

### Thanks

This work was supported by funds from the European Community's 6<sup>th</sup> Framework Programme for Research and Technological Development as part of the "SCARLED" project SSPE-CT-2006-044201.

The views in this article are those of the authors and do not necessarily reflect the viewpoint of the European Commission.

**Figure 2:** Structure of the fuzzy logic model to simulate a household's potential for income diversification



Source: Own illustration.

## Further literature

AJZEN, I. (1985): From intentions to actions: A theory of planned behaviour, in *Action-control: From cognition to behaviour*, KUHI J., BECKMANN, J. (eds.): Heidelberg, D: Springer Verlag, pp. 11-39

BARRETT, C., REARDON, T., WEBB, T. (2001): Non-farm income diversification and household livelihood strategies in rural Africa: Concepts, dynamics, and policy implications, *Food Policy*, 26 (4), pp. 315-331.

BUCHENRIEDER, G. (2005): Non-farm rural employment – Review of issues, evidence and policies, *Quarterly Journal of International Agriculture*, 44 (1), pp. 5-18.

BUCHENRIEDER, G. (2003): Risk management of farm households in northern Vietnam, in *Sustainable land use and rural development in mountainous regions of Southeast Asia*, UNIVERSITY OF HOHENHEIM (ed.): Stuttgart, D: University of Hohenheim, pp. 669-715.

EFSTRATOGLOU-TODOULOU, S. (1990): Pluriactivity in different socio-economic contexts: A test of the push-pull hypothesis in Greek farming, *Journal of Rural Studies*, 6 (4), pp. 407-413.

MAMDANI, E. H., ASSILIAN, S. (1975): An experiment in linguistic synthesis with a fuzzy logic controller, *International Journal of Man-Machine Studies*, 7 (1), pp. 1-13.

MÖLLERS, J. (2006): Außerlandwirtschaftliche Diversifikation im Transformationsprozess – Diversifikationsentscheidungen und -strategien ländlicher Haushalte in Slowenien und Mazedonien, *Studies on the Agricultural and Food Sector in Central and Eastern Europe*, Vol. 35, Halle (Saale).

REYS, M. A. DOS (2003): Farming and rural systems analyses in forest margins: An application of fuzzy theory. The case of West Tocatis, Brazil, in: DOPPLER, W., BAUER, S., WEIKERSHEIM, D. (eds.): *Farming and Rural Systems Economics*, Vol. 48, Margraf Verlag.

SIVANANDAM, S. N., SUMATHI, S., DEEPA, S. N. (2007): Introduction to Fuzzy Logic using MATLAB, Heidelberg: Springer Verlag.

SMITHSON, M., VERKUILEN, J. (2006): Fuzzy set theory. Applications in the social sciences, *Series: Quantitative Applications in the Social Sciences*, No. 07-147, Thousand Oaks, Florida, USA: Sage publications.

ZADEH, L. A. (1965): Fuzzy sets, *Information and Control*, 8, pp. 338-353.



## Large and small side by side – For how much longer? The future of individual farms in the dual farm structure of Central and Eastern Europe

HAUKE SCHNICKE, KATHRIN HAPPE, CHRISTOPH SAHRBACHER, KONRAD KELLERMANN

Since the beginning of the 1990s dual farm structures have existed in many Central and Eastern European countries. In other words, many small farms are operating beside a few large enterprises. A large proportion of production comes from only a small section of farms. Smaller farms are organised as family or individual businesses, whereas large farms can usually be classified as corporate entities. Table 1 illustrates this using the examples of the Czech Republic, Hungary and Slovakia. Although individual enterprises are significant as far as their sheer numbers are concerned, and in the number of people employed by them, the proportions of farmland they work and overall production

volumes they are responsible for are low, owing to their very small size. In Slovakia, for example, 99 % of all farms are individual concerns, accounting for 45 % of agricultural employment. These farms, however, contribute only 20 % of total produce on 18 % of farmland in Slovakia. Often they are run by older people. More than 40 % are in the age group "55 and older". Younger farm managers (35 and younger) are rarer (8 % in Hungary and 12 % in the Czech Republic). The figures show that the average age of those running individual farms is on the increase. The reason why many active farm managers today are advanced in age is that these persons dared to move back into independent

**Table 1: Importance of individual farms for agriculture (Czech Republic, Hungary, Slovakia, 2005)<sup>a</sup>**

	Unit	Czech Republic	Hungary	Slovakia
Total	% of all farms	93 %	97 %	99 %
Farmland	% of total farmland	29 %	49 %	18 %
Farm size (Ø)	Hectare	26ha	3ha	5ha
Labour	% of total farm labour	31 %	81 %	45 %
Production	% of total production volume	24 %	52 %	20 %
<b>Age of farm manager (sole owner) in individual farms</b>				
35 and younger	% of individual farms	12 %	8 %	9 %
55 and older	% of individual farms	41 % <sup>b</sup>	45 % <sup>b</sup>	46 %

Source: EUROSTAT (2005; 2007).

Notes: <sup>a</sup>) Including subsistence farms, <sup>b</sup>) Data from 2003.

farming in the period of upheaval of the early 1990s, but are now on the verge of either quitting agriculture, or handing the farm over, respectively. Looking to the future survival of the farms, the fact that they have not yet been handed over to the next generation – if indeed they ever are – might mean that there are no successors around and/or that potential successors have already taken a career outside agriculture, or intend doing so.

There are other aspects important for potential successors. Frequently it is non-economic motives that make people decide against taking over a farm business. It might be that they have no interest in, or identification with, the career profile of farming, or that they prefer a more modern, urban lifestyle. The migration from the countryside to the city is thus often a conscious, intentional decision. Compelling personal decisions can also be a consequence of an individual's age, for example, or their education. External circumstances, such as the general economic climate or the level of agricultural support payments, can also influence a person's decision to quit farming or to enter the sector. Support measures became particularly important with accession into the EU. When people obtain a non-agricultural job, on the other hand, they often expect a higher income for less work.

That is how things stand at present. But given the circumstances, is there a future for large and small-scale farming side by side? What will be the likely consequences for structural change of an aging workforce and a lack of successors on individual farms within the dual agricultural structure of many Central and East European countries? When will masses of farm successions become due out of necessity? Can other individual farms which do have a successor benefit from the lack of successors in other farms, or is it the large enterprises that profit?

## **A simulation of dual structures**

We can address these questions by means of the simulation model AgriPolis. AgriPolis is used at IAMO for a wide variety of questions relating to structural change. It allows the development of an agricultural region to be modelled virtually on a computer. Key features which distinguish a real agricultural region as a whole and more specifically the agricultural enterprises operating within it, are simulated in the model. These include, for example, auditing one's own business activities, the optimisation of farming and investment planning, and the consideration of external conditions such as interest rates, wage levels, and current agricultural policy. Individual farms aim to maximise their household income; corporate entities maximise their profits. Subsistence farms are not taken into account; it is assumed that all the farms engage in market production, and the smallest farm in this simulation has 5 hectares of farmland. The auditing of a farm's activities is also linked to decisions about the future optimal use of farm resources, i.e. if a business concludes that its manpower, land and capital are more profitable outside the farm, this is the preferred option and active production is stopped. Illiquidity is another cause of farm closure. In the model, the development of the region as a whole results from the development of the individual farms and the interaction between them. There is interaction on the land market, for example, when farms compete for plots of land that become available; the farm that offers the most gets the land. An agent-based model can not only provide analyses according to farm type, e.g. differentiating between individual farms and corporate enterprises, it also allows analysis at the individual farm level.

In this instance, the model depicts a dual farm structure on the basis of one region in Slovakia. To reflect the fact that individual

farms are characterised by an older workforce, the assumption is made when inputting the initial ages of farm managers that more of them are in the older age groups. With an equal age distribution there would be the same number of farm managers in each age group. The scenario label "Ü\_" stands for an age structure with a disproportionately high ratio of older people.

In the model there is a change of generation every 25 years. For the group of corporate enterprises it is assumed that these farm exclusively using hired labour, which means that there is no problem of succession. Over the course of a generation, individual farms in the model quit agriculture either because they lack capital, or because they conclude that they can make a more profitable use of their resources outside farming. At the point where generations change farms cease production, either because it makes no economic sense for potential successors to get started, or because these successors have non-financial motives which prevent them from entering agriculture. This is the focus of the following scenarios.

In scenario Ü\_100 it is assumed that there is always one successor willing to carry on the farm business. This successor can also be a person from outside the family. As in the real world, however, the succession will only take place if it is more profitable than taking a non-agricultural job. As entering into farming is a long-term career choice, and the necessary training must be seen as an investment, 25 % is added on to a comparable commercial wage when there is a change of generations. In other words, where a farm continues production, the expected agricultural income must be 25 % higher than that which can be earned outside the farming sector. The scenario Ü\_50 ascribes to a potential successor non-economic motives which make it

likely that he will decline the succession, irrespective of the size and profitability of the farm in question. For an individual farm, the likelihood that a potential successor will actually take over the business is 50 % at the point of generational change. If this does happen, the successor will also weigh up his alternative income possibilities outside of the farm, however.

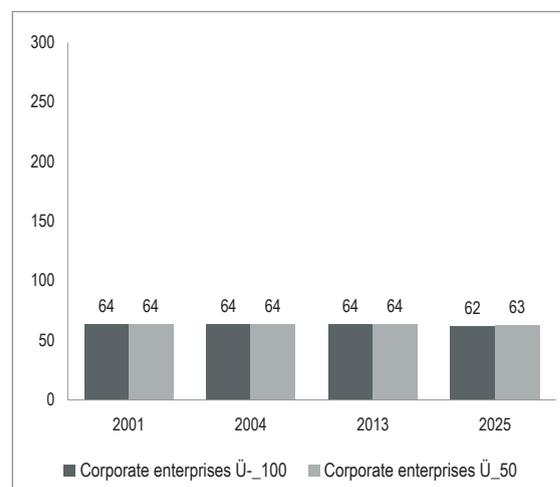
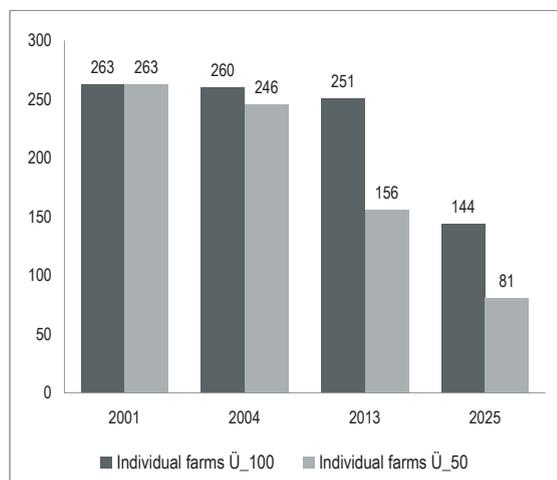
Policy is also important. During the course of EU accession in 2004, the countries of Central and Eastern Europe enjoyed gradually rising premium payments from the EU's agricultural budget. National payments supplement these. This agricultural policy framework is taken into consideration. Also built into the model is the assumption that the economies of Central Europe will continue to grow with an assumed annual wage increase of 2.5 %.

## Findings

Figure 1 shows the development of individual farm and corporate enterprise numbers in scenarios Ü\_100 and Ü\_50 in the Slovakian case study region. For reasons of data processing, only one quarter of the region is depicted. Four points in time were documented. The simulations begin under the pre-accession policy of 2001. From 2004 a phase of gradually rising direct payments begins in the course of EU accession. This finishes in 2013, while 2025 is the long-term conclusion of the simulations.

There is a clear long-term drop in the total of individual farms, but – as is to be expected – the number of individual farms quitting agriculture where the succession is uncertain is higher from the start. In this scenario, starting with an age structure dominated by older people results in a relatively high number of farm handovers taking place in the first few years of the simulations;

**Figure 1: Development of farm numbers in the years 2001, 2004, 2013 and 2025**



Source: Own calculations.

and the lack of a willing successor results in a sharp decrease in individual farm numbers. With an equal age distribution individual farms would quit agriculture at a later date. A glance at the corporate enterprises shows that almost all of them remain in the agricultural sector over the entire period, and that they represent, as far as numbers are concerned, a constant factor within the dual structure. In scenario Ü\_100 several individual farms suddenly quit agriculture after an initial phase of around 12 years. What are the reasons for the initial persistence of individual farms and the subsequent disappearance of a number of them? What distinguishes those farms that quit from those that continue in production?

First, the introduction of direct payments provides a greater incentive to remain in the agricultural sector. The continuing rise

in payments increases this incentive. Rising premium levels, however, are accompanied by an increase in lease prices – wage costs continue to rise annually, independently of these developments. As soon as direct payments stop rising, profit margins are reduced. For many farms, renting out their land and taking up non-agricultural employment suddenly become more profitable alternatives. This is particularly the case with regard to small farms. They cannot make cost savings through economies of scale, which means that they are the first farms to quit, thereby giving the remaining farms the opportunity to expand and exploit these very savings.

Scenario Ü\_100 has the built-in assumption that all potential successors are willing to take over a farm. We can see that the succession – if it comes up during the period of rising direct

payments (2004-13) – takes place in almost every case. That is to say, the economic assessment prior to a career choice comes out on the side of farming, even taking into account the 25 % supplement added to the comparative commercial wage. All this changes, however, if the farm succession takes place in the period after 2013. Now far fewer successors enter farming. Moreover, those successors who have taken over a farm only a few years previously may now have to contemplate quitting agriculture and a undergoing a career change. Right from the beginning of scenario Ü\_50, it is even more the case that the individual farms remaining in agriculture benefit from those that quit, by expanding their land holding. We also see, however, that those farms which quit agriculture in scenario Ü\_100 also quit in scenario Ü\_50, i.e. typical "dropout farms" cannot benefit here from greater growth opportunities.

### **Conclusion**

Given the specific dual structure and the disproportionate ratio of older people at the starting point it is likely that farm successions will not take place on an ongoing basis, but that their frequency will run in cycles, and that in the next few years we can expect a wave of potential farm successions. This phase follows a longish phase in which farm successions have not come up due to demographic circumstances, or in which they have been postponed.

When non-economic motives that militate against a career in agriculture are included for consideration, farms quit agriculture in greater numbers. A depiction of career decision behaviour deriving exclusively from the best assessment of one's own resources shows that the policy environment offers a strong

(mistaken) incentive for entering farming, a decision which may have to be revoked in the longer term. In the long-term perspective it becomes clear that subsidies are capitalised into land rents and therefore transferred to landowners. On the other hand, a long-term increase in wage levels outside the agricultural sector represents a greater incentive for migration which, in this case, will only be temporarily mitigated by a policy of agricultural subsidies. We can also see that large agricultural enterprises – which increasingly have their origins in the group of individual farms – have a large enough profit margin thanks to economies of scale to cover all direct and imputed costs. The strong growth of some individual farms highlights the fact that these, in relation to their size, can increasingly assume features of corporate farms. This trend can also be seen in real life, where often several individual farms come together to form partnerships, which means that the size of these farms can no longer be an automatic indicator of their legal status.

### **Further literature**

SCHNICKE, H., HAPPE, K., SAHRBACHER, C. (2007): Structural change and farm labour adjustments in a dualistic farm structure: A simulation study for the Region Nitra in southwest Slovakia, *IAMO Discussion Paper No. 112*, Halle (Saale).



## The flexibility of Polish family farms in transition

SWETLANA RENNER

Agricultural enterprises in transition countries face an environment which is changing ever more rapidly. The imperfection of markets and severe fluctuations in demand associated with transition processes increase the risks of agricultural activity, and farms need to take account of these. Farms have to adapt to these changes in order to guarantee competitiveness, income security, and even future survival. Flexibility is thus an important quality to survive successfully in the market.

The agricultural sector in Poland is characterised by a large number of small family farms. Although these businesses have low productivity, the small-scale agricultural structure has survived both the years of transition and EU accession. One possible explanation for this is that these small farms have more flexible systems of production, with which they can compensate for their inefficiencies of scale and relatively low productivity. For example, small farms can react more quickly to changes in external circumstances. It may be that they are in a position to change their product mix more rapidly and effectively, or even to change from crops to livestock farming. This mitigates insecurities associated with changing market conditions and thus stabilises income. Rural households are also involved in a variety of non-agricultural activities. This allows family farms to access additional sources of money and thus overcome cash-flow problems. Access to additional production factors, especially capital and labour resources, is important if a farm is to adapt to the production volumes and production structure demanded by the market.

In spite of some advantages, family farms also have disadvantages with regard to adaptation. The largest obstacles generally come from restricted access to alternative forms of financing (access to capital markets, financing insecurity vis-à-vis investors) and a lack of qualified manpower (management, operations, technology). These facts suggest that it is difficult to separate a farm from the household, and that many factors are combined in an interdependent relationship.

Existing theoretical and empirical studies on the flexibility of farms mainly deal with the industrial sector. There are only a few empirical works that analyse flexibility in the agricultural sector. Neither is there much consideration in the relevant literature of the socio-economic characteristics of agricultural households. This paper will, therefore, examine the determinants of flexibility of Polish family farms in transition. The analysis looks at the flexibility of production technology and considers the adaptation of the production programme in relation to the overall output and the production combination (product mix). First of all we have to define flexibility and determine an appropriate way of measuring and recording flexibility. Then we will identify the factors influencing the adaptability of family farms and their possible effect on flexibility. The empirical analysis is based on a panel data set of 562 Polish family farms, to examine in more detail farm flexibility and its determinants for the period 1994 to 2001.

## Defining and measuring flexibility

In very general terms, flexibility is understood as the adaptability of a system to changes. The flexibility of a production technology, for example, is usually understood as the capacity to adapt the production programme to market fluctuations. In the relevant literature there is no agreed theoretical framework for the analysis of flexibility, and a variety of different ways exist of measuring it. In this analysis we make the distinction between the flexibility of total output (*scale flexibility*) and the flexibility of the product mix (*scope flexibility*).

*Scale flexibility* is defined as the capacity of a farm to adapt its total output to changes in the external environment. Following WEISS (2001) the measure for scale flexibility is the variance of logarithmmed and deflated total production:

$$F\_scale_{it} = \left[ \ln (Q_{it} / \bar{Q}_i) \right]^2 \quad (1)$$

Here, the indices  $i$  and  $t$  denote the farm and time period in question.  $Q_{it}$  denotes the total agricultural production of farm  $i$  in year  $t$ , and  $\bar{Q}_i$  denotes the average output of farm  $i$  over the whole period covered by the study. All production levels were deflated with the corresponding price indices.

*Scope flexibility* is the capacity of a farm to adapt its product mix to changes in the market situation. A variety of measurements can be used here to quantify the extent of changes in the production structure over time. A Michely-Stoikov index was used for this analysis to measure the structural changes. This index measures the sum of absolute changes of the individual shares of products between two periods:

$$F\_scope_{it} = \sum_{j=1}^J \left| s_{jit} - s_{ji(t-1)} \right| \quad (2)$$

Here, the variable  $s_{jit}$  denotes the share of product  $i$  in total output of farm  $i$  in year  $t$ :  $s_{jit} = q_{jit} / Q_{it}$ . Fourteen agricultural products were used for the calculation.

## Determinants of flexibility

This study distinguishes between two groups of factors which influence the adaptability of a farm. These are economic and socio-demographic factors specific to the farm (Figure 1). The factors in the first group are based on book-keeping data and change over time. The variables in the second group differ from one farm to another, but do not vary over time, or only slightly. We will first discuss theoretical hypotheses relating to the influence of different factors on flexibility, and then test these in the empirical analysis.

### *Influence of economic factors on flexibility*

One of the most important questions of this study is whether small farms have advantages over large farms in the use of more flexible technologies. For the analysis of the connection between farm size and flexibility it is necessary to define an appropriate benchmark for the size of an agricultural enterprise. In the literature there are many different measures of farm size. Some authors use the physical volume of resources employed in the production process, such as quantity of farmland, livestock holding or manpower. Other authors recommend the use of monetary measures such as asset balance, income, total assets, standard gross margin etc. Physical measures of business size are used for analysing farms which specialise in either crop

or livestock production. As Polish agriculture is characterised by heavily diversified farms, the measure of business size used here is total assets, which includes all factors used in production. For the empirical analysis the asset values have been deflated to their respective prices with the corresponding price index.

We hypothesize an inverse relationship between flexibility and firm size. This means that small farms are more flexible than large ones. Small family farms consequently have the advantage over larger ones that they can react more quickly and economically to changes in the external environment. On the other hand, although large farm units have less flexibility, they enjoy the comparative advantages of increasing economies of scale and low average costs. The trade-off between flexibility and productivity is thus quite apparent.

Changes in the agricultural situation do not only represent a threat for farms. They also offer opportunities to farmers if these can react to the changes by adapting their production plans correspondingly. These adaptations are often linked to a reallocation of resources and new investments. Access to additional income sources can boost farms' adaptability to changes in the agricultural situation. We are looking at three alternative sources of income – income earned outside of agriculture, access to credits and state subsidies – and we expect that these variables will have a positive influence on flexibility.

Further we argue that the degree of commercialisation, defined as a share of sales in the gross output value, has a positive influence on flexibility. If farmers use most of the goods they produce for their own consumption, they do not have to change their product mix or total output any more than is needed for their own

use. Farmers who sell a large proportion of their output on the market, however, are more tightly integrated in market-based relations and have to react in accordance with changes in demand and other changes in the market situation.

Specialisation in capital-intensive production technologies probably has a negative influence on the flexibility of an agricultural enterprise. As milk production is associated with high long-term, specific investments, it is likely that where a large proportion of a farm's output is comprised of dairy products, this will have a negative effect on flexibility.

#### *Influence of socio-demographic factors on flexibility*

Family farms represent a unique style of commerce. They are heavily influenced by certain characteristics pertaining to the family and the farm manager. For this reason it is necessary to examine the influence on flexibility of factors such as the size and structure of the family, the age and education of the farm manager, and his attitude towards risk-taking. We may suspect that flexibility decreases as the farm manager gets older. Older farmers are less willing to take risks than younger decision-makers, and they prefer less flexible forms of organisation. On the other hand, older farmers are more experienced and are better able to assess the effects of different factors and decisions on the production process. In view of the sweeping changes in the political and economic environment during the period of transition, however, we may suppose that formal agricultural education is more important for adaptability than practical experience. We can therefore assume that succession, that is to say the handing-over of the running of the farm to one's heirs, has a positive influence on flexibility. Variables such as the gender of the farm

manager and family size (measured by the number of family members) were also included in the model, in order to examine the possible effects of these characteristics on flexibility.

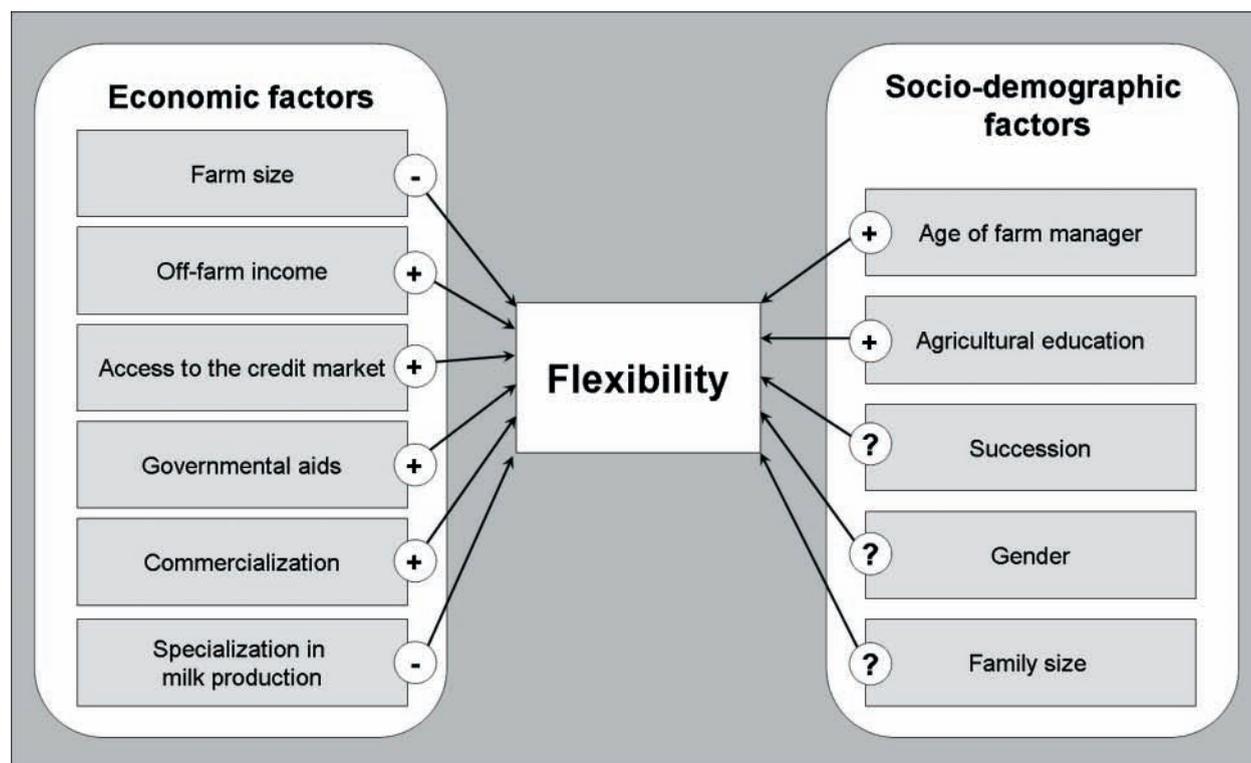
### Data set and findings of the empirical analysis

The data for the empirical analysis were provided by our project partner, the Polish Institute for Agricultural and Food Economics (IERiGZ-PIB). The data set includes book-keeping data and a variety of socio-demographic information from annual surveys of 562 farms during the period 1994 to 2001. As the existing

panel data set contains time-invariant variables which belong to the second group of farm- and family-specific socio-demographic factors, the assessment of the regression parameters was carried out using a specific, two-stage econometric procedure. In the first stage a fixed-effects-model considered only the economic factors of the first group. The second stage saw the estimation of the parameters for the second group of time-invariant socio-demographic factors in an OLS model.

The findings of the econometric analysis do not contradict our theoretical hypotheses with regard to the effect of the variables

Figure 1: Determinants of flexibility



on flexibility. The considered variables significantly influence flexibility, and the estimated parameters show the expected signs. The negative relationship between farm size and flexibility was confirmed. This supports our hypothesis that small farms have greater flexibility, in adapting both their overall production and product mix.

The findings also make clear that the additional income sources which farmers exploit are used to adapt their production programme. All forms of income that were looked at (non-agricultural income, credits and state subsidies) have a significant positive influence on flexibility. This shows that financial hurdles can restrict the development and adaptability of family farms in Poland.

The degree of commercialisation has a significant positive influence on flexibility, with regard to both total output and the product mix. This confirms our hypothesis that there is a greater incentive for farmers who are more involved in product markets to use flexible technologies in order to address changed market demands. It was also shown, in accordance with our hypotheses, that producers who specialise in capital-intensive technologies, such as milk production, are less flexible.

The influence of socio-demographic factors has proved to be less clear. Although the age and education of the farm manager

have shown themselves to have a significant influence on flexibility, there are no statistically verified results for the remaining variables. We can conclude from the findings of the model that farms where the head of the family is younger and better educated are more flexible. However, our parameter estimators of family size, the gender of the farm manager and the succession were not statistically significant.

To conclude, we can state that the adaptability of family farms is influenced by a variety of economic and socio-demographic factors. Consequently, the findings from our study allow us to account for the existence of farms with differing flexibility in their technologies, as well as the co-existence of large and small farms in the Polish agricultural sector.

#### **Further literature**

RENNER, S., PIENIADZ, A., PETRICK, M. (2007): Flexibility of Polish family farms during Transition, in: SCHÄFER, C., RUPSCHUS, C., NAGEL, U. J. (eds): Enhancing the Capacities of Agricultural Systems and Producers, Proceedings of the Second Green Week Scientific Conference, MACE, Berlin, 16-17/01/2008, pp. 274-80.

WEISS, CH. R. (2001): On flexibility, *Journal of Economic Behaviour & Organization*, 46, pp. 347-56.



# Farm partnerships as a strategy for improved profitability

KARIN LARSÉN

## Abstract

This article discusses various aspects of partnerships among farmers based on empirical results from Sweden. Partnerships among farmers, in the form of for example machinery- and labour-sharing arrangements, may imply several benefits such as reduced machinery costs, task specialization among the partners and access to more advanced technology. For risk averse farmers, partnerships may be a way to spread the risk by, for example, diversification among production activities. This research shows that the gains attributable to these factors can be substantial. Also a potential cost of partnerships, the risk of opportunistic behaviour, has been analyzed. The results from a questionnaire suggest, however, that these partnerships are often characterized by good personal relations and mutual trust among the partners, which mitigates opportunistic behaviour.

## Introduction

Machinery- and labor-sharing arrangements among farmers are becoming increasingly common in many countries including Sweden. About 60 % of the Swedish farms were involved in some form of partnership arrangement with one or several other farms in 2006 (LARSÉN, 2008). The forms of the partnerships vary widely – from informal exchange of labor and machinery to common ownership of all machinery. In some cases, the partnership farmers also have coordinated purchases of production factors and/or coordinated marketing of products.

This article summarizes some research findings related to various aspects of partnerships among farmers. Some questions that have been targeted in this research are:

- What are the advantages and disadvantages of partnerships?
- Does collaboration pay off?
- How important are the social aspects?

Potential gains from partnerships include reduced capital costs, the possibility to invest in more advanced technology and task specialization among partners. Potential costs include so-called timeliness costs (i.e. foregone revenues when a farmer is not able to perform a certain task at the optimal point in time) and the risk of opportunistic behavior among the partners. This research has not only shown that economic gains from partnerships can be substantial, but also that the social aspects often are very important. Problems with opportunistic behavior are generally perceived as low and the partnerships are often characterized by high levels of trust and good social environments.

## Benefits and costs of farm partnerships

One of the probably most obvious benefits from machinery collaboration among farmers is the reduced cost of machinery. As sharing makes it possible to use machinery more intensively, the fixed cost per hectare can be reduced. Self-financing is also easier when several partners get together to buy machinery and equipment, which implies lower interest costs. Furthermore,

pooling of resources may facilitate investments in more powerful and advanced machinery. With better technology, yield losses can be reduced, and the quality of fodder increased. Moreover, higher environmental and quality standards imply that some operations must be undertaken with a greater precision – requiring more advanced technology – which may be facilitated through a partnership arrangement.

Partnerships also make it possible for the individual farmers to specialize in different tasks on the farm. For example, a farmer who operates a certain machine more frequently will improve his/her skill and, as a result, the productivity of labor will increase.

Risk sharing and diversification in production activities can also create incentives to participate in a partnership where revenues and/or costs are shared. Agricultural production is characterized by uncertainty and variations in for example output prices and weather (and hence yields) which contribute to uncertainty of farmers' net incomes. Therefore, partnerships where revenues and costs are shared may be attractive for farmers who are risk-averse. When farmers buy machinery and implements jointly, the risk associated with trying a new technique is shared. Joint operation may also facilitate better possibilities to take advantage of crop rotation effects as well as diversification of production activities.

Yet another advantage of partnerships is the possibility of obtaining higher product prices through coordinated marketing of products as well as paying lower factor prices through coordinated purchases of production factors.

But there are also potential costs of partnerships. For many types of field operations, it is costly for the farmer it cannot be

performed at the optimal point in time. This may be a problem when two or more farmers share machinery. For example, delayed harvesting could imply a poorer quality of the crop and accordingly reduced return for the farmer. This cost is often referred to as timeliness cost and its magnitude depends on several factors such as soil quality, type of crop and type of field operation.

In the contract theory literature it is often presumed that partners in contractual arrangements act opportunistically if they have the possibility to do so (i.e. if asymmetric information is present). Thus, this contract cost, often referred to as the moral hazard problem, may arise when an agent cannot fully observe the action of his/her partner(s). In the case of farm partnerships, this could mean that a farmer is not as precise when performing a task for a partner as compared to when performing the task on his own land. It could also mean that the farmer does not take as good care of borrowed or shared machinery compared to if it was fully owned by the user. However, it is not obvious that opportunistic behavior is a problem in farm partnerships. It must be kept in mind that these partnerships in many ways differ from other type of business contracts. Often, the farmer has a personal relation to his/her partners (neighbors, friends, relatives). It is reasonable to believe that opportunistic behavior is more costly in social terms when one has a personal relationship to the partners, while at the same time the level of trust is likely to be higher.

### **Forms of partnerships**

A questionnaire concerning farmers' involvement in machinery- and labour-sharing arrangements with other farms/farmers was

sent to approximately 1,000 farms in Sweden in spring 2006 (see LARSÉN (2008) for further details). Approximately 60 % of the responding farmers in the survey indicated that they collaborate with one or several other farms. The partnership farms were, on average, larger (in terms of land) and farmers involved in partnership arrangements are, on average, younger than non-partnership farmers.

The partnership farmers were asked about the form of their collaboration and activities that the partnership involves. The results are reported in Table 1. Two of the most common forms of collaboration were to own machinery jointly and hire services (37 % each). Other common forms of collaboration were to operate one's machinery for each other and mutual exchange of machinery. A small proportion of the surveyed farms stated that they cultivate land together with other farmer(s) or have joint operations.

**Table 1: Forms of partnerships and activities covered by the partnerships**

	<b>Share</b>
Farms involved in any form of partnership arrangement with other farms	0.62
<b>Form of collaboration</b>	
Owning machinery jointly	0.37
Mutual exchange of machinery	0.27
Operate own machines for each other	0.32
Hire services from, for example, a machinery station	0.37
Cultivate land jointly with other farmer(s)	0.04
Joint operation with other farmer(s)	0.02
Network of exchange of machinery services with other farmers (Machinery ring)	0.13
Coordinated marketing of products and/or purchase of production factors	0.10
Other form of collaboration	0.02
<b>Activities covered by the partnership</b>	
Ploughing/harrowing	0.24
Sowing	0.26
Fertilizer application	0.14
Pesticide application	0.21
Harvest of cereal crop	0.24
Harvest of silage	0.33
Harvest of potatoes	0.03
Harvest of sugar-beets	0.06
Purchase of production factors	0.08
Marketing of products	0.02
Other activity	0.12

Source: LARSÉN, 2008.

The jobs most often involved in partnerships were harvest of silage, sowing, cultivation, harvesting of cereal crops and pesticide application.

The partnership farmers were also asked about the forms of their contracts. In general, the contracts were not very detailed and in approximately 80 % of the cases there was only a verbal agreement. In most cases, the agreement was not specified for a fixed period of time. (LARSÉN, 2008).

### **Do partnerships pay off?**

From an economic point of view, an interesting question is of course how what the economic gains from partnerships are. This has been analysed both through calculations based on data from a large sample of (partnership and non-partnership) farms, as well as through case studies. In the first case, information obtained from the questionnaire mentioned above was matched with information about revenues and costs of the farms obtained from the Farm Accountancy Data Network (FADN). In order to compare performance among the different groups of farms, an efficiency score that measure how efficient a farm is in "transforming" inputs (production factors) to outputs (farm products) was calculated for each farm using all farms (partnership and non-partnership) as the reference group (see LARSÉN (2008) for details). It is thus a relative measure where each farm is compared to the most efficient farms in the sample. It was found that partnership farms in the sample were, on average, more efficient as compared to the non-partnership farms. Partnership farms with the highest degree of collaboration (that share all machinery) displayed the highest efficiency scores. Moreover, gains from collaboration were more pronounced for crop farms

than for livestock farms. Also when other factors such as the farmer's age, farm size and geographical localization were controlled for, the impact of partnerships on farm efficiency was found to be positive and statistically significant.

In case studies it was found that benefits from improved possibilities to take advantage of crop rotation effects, risk sharing and diversification can be substantial in partnerships involving farms with different production specialisations such as dairy and crop farms (SAMUELSSON et. al., 2008). Potential utility gains (money metric values) amounted to 6-24 % for the dairy farms, and was even higher for the crop farms. Naturally, the gains from risk sharing and diversification increase as the farmers' willingness to take risks decrease. Moreover, the gains from collaboration increased when the partnership also covered machinery-sharing.

### **Some further aspects**

As mentioned above, a potential problem in any type of contractual arrangement characterized by asymmetric information is the risk of opportunistic behaviour among the partners. In order to analyse whether opportunistic behaviour is a problem in existing farm partnerships, the farmers in the survey were asked about perceived trust in their partnerships and whether they think that their partners perform their tasks in a satisfying way. The results from the survey suggests that there is a high degree of trust among in existing partnerships and that problems with opportunistic behaviour are perceived as very small or non-existent. A general impression is that partnership farmers are, on the whole, satisfied with the social circumstances in their partnership. Actually, the social aspects of partnerships – to have

someone to discuss and exchange experiences with – often seemed almost as important as the economic benefits (and in some cases maybe even more important).

So far nothing has been said about the non-partnership farms. However, also these farmers were asked to respond to various statements in the questionnaire concerning why they do not collaborate with other farmers. One of the most important reasons was the wish to remain independent. The risk of opportunistic behavior of potential partners was not a reason for choosing to operate independently; the surveyed non-partnership farmers did not seem worried that potential partners would not give their full efforts in a partnership. Around one third of the non-partnership farmers stated that they earlier had been involved in machinery- and labor-sharing arrangements with other farmers. Of these, only about 10 % indicated that social factors were the reason why the collaboration was terminated.

## Conclusions

Partnership arrangements among farmers may take different forms including joint ownership and mutual exchange of machinery. They may also cover different jobs at the farm. Potential benefits include reduced cost for machinery and equipment, improved possibilities to use better machinery and task specialization. Empirical results based on data from Sweden have shown that gains attributable to these factors can be substantial, and that the magnitude of the gains increases when the extent of the partnership increases. Potential costs of partnerships include the risk of opportunistic behavior among partners. However, existing partnerships among Swedish farmers are characterized by high levels of trust and problems with opportunistic behavior

are perceived as very low. In general, the natures of the contracts are relatively simple and in most cases they are only verbal.

## Further literature

ANDERSSON, H., LARSÉN, K., LAGERKVIST, C-J, ANDERSSON C., BLAD, F., SAMUELSSON, J., SKARGREN, P. (2005): Farm Cooperation to Improve Sustainability, *AMBIO: A Journal of the Human Environment* 34(4), pp. 383-387.

LARSÉN, K. (2007): Participation, incentives and social norms in partnership arrangements among farms in Sweden. Selected Paper at the American Agricultural Economics Association Annual Meeting, Portland, OR, July 29-August 1, 2007.

LARSÉN, K. (2008): Economic Consequences of Collaborative Arrangements in the Agricultural Firm. *Acta Universitatis Agriculturae Sueciae. Doctoral Thesis No. 2008:28*. Faculty of Natural Resources and Agricultural Sciences, Swedish University of Agricultural Sciences.

SAMUELSSON, J., LARSÉN, K., LAGERKVIST, C-J, ANDERSSON, H. (2008). Risk, return and incentives aspects on partnerships in agriculture, *Food Economics – Acta Agriculturae Scandinavica C* 5(1), pp. 14-23



*IAMO building*

## IAMO – A brief portrait

### Aims and tasks

The Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO) focuses on the far-reaching economic, social and political processes of change in the agricultural and food sector, and in rural areas. Its geographical area of research extends across Central, Eastern and South-eastern Europe, including Turkey. The transition countries of Central and Eastern Asia have been added to this remit. In spite of great efforts and much success, the development of agriculture and the food economy in many of these regions is still far behind that of Western industrial nations; and some of them are following their own, very specific development paths. In addition, an enormous gap is emerging between successful and stagnating regions within individual countries and between countries. It is clear that agriculture and the food economy, as well as the policy of the expanding Union, are also affected by these divergent developments. Because of this, IAMO is faced with a very broad challenge for research, both thematically and regionally.

With its thematic and geographical focus, IAMO is a unique global research institution. Since its establishment in 1994 it has belonged to the Leibniz Association as a non-university research centre. The Leibniz Association includes research institutes which are scientifically, legally and commercially independent, together with service institutions. Both these are jointly funded by the federal administration and the Länder to work on current problems of national interest ([www.leibniz-gemeinschaft.de](http://www.leibniz-gemeinschaft.de)).

IAMO's work is not just aimed at helping to understand, but also to cope with the transition processes that are not yet complete, and to manage the far-reaching processes of change to reduce ongoing development deficits in the agricultural and food sector, as well as in the rural areas of the Institute's geographical area of research. This goal gives rise to the three core tasks of the Institute:

- Internationally oriented research into agricultural and food economics including the development of rural areas;
- Exchange of ideas between the academic, business and political communities;
- Support for young academic scholars.

The Institute sees itself as a driving force of international research into agricultural economics. Outstanding research is the engine of the Institute's development, and it creates the conditions in which the other two core tasks can be performed. For instance, IAMO acts as a forum for exchange, and in this way it supports the interlinking of research and dialogue between decision makers from the academic, political and business communities. It also uses its expertise and capacities to help academic scholars become fully qualified. Here there is a particular focus on supporting young academics from partner countries. Through its international orientation and cooperation with other teaching and research institutes, IAMO is helping to strengthen Halle's profile as a centre of science and research in Central Germany.

Our close cooperation with Martin Luther University Halle-Wittenberg (MLU) – especially with the Institute of Agricultural and Food Sciences at the Faculty of Natural Sciences III, and the Economic Sciences Department at the Faculty of Law and Economic Sciences – is an important factor here.

### **Academic departments, research fields and key topic areas**

IAMO's threefold research structure with the departments Agricultural policy, Agricultural markets and Structural development (these are short descriptions) is derived from the orientation of its research. The basic conditions of agricultural policy and opportunities for shaping policy, markets in the agricultural and food sector, and the development of farms and structures in rural areas are all analysed by the Institute. Developments at the individual farm level and in rural areas, the development of functioning agricultural markets, and the shaping of agricultural policy are all closely interrelated. Correspondingly, IAMO's academic work is organised interdepartmentally into four key research areas which focus on major problem areas of agricultural development in Eurasian transition countries and emerging nations. The more intensive level of communication in key research groups counteracts any possible fragmentation of research. Besides positive bundling effects, greater individual responsibility of the key research groups allows efficient, result-oriented research management.

The idea behind the new medium-term agenda (2008-2015), which came into effect at the start of 2008, was to adapt the key research areas to the changing problems in those regions of the world studied by IAMO. Increasingly, it is general questions of agricultural development in the context of globalisation and increasing divergence – between countries and also between

structurally weak and dynamic regions – that are coming to the fore. But even if, to take Central Europe as an example, transition-specific questions themselves are scarcely important any longer, the socialist past still influences the development of the agricultural and food economy of that region. Here we could point to the unique dual farm structure of many EU accession states in Central and Eastern Europe. The new medium-term agenda, in effect since January 2008, contains the following four key research areas:

- I. Policy reforms and institutional change;
- II. Structural change and growth processes;
- III. Employment and livelihoods;
- IV. Competitive strategies and market requirements.

### **Institutional structure**

IAMO is a public foundation. Its bodies are the board of trustees, the directorate and the scientific advisory board. The Institute is divided into three academic departments:

- External Environment for Agriculture and Policy Analysis; head of department is Prof. Dr Gertrud Buchenrieder (*née Schrieder*);
- Agricultural Markets, Marketing and World Agricultural Trade; head of department is Prof. Dr Thomas Glauben;
- Structural Development of Farms and Rural Areas; head of department is Prof. Dr Alfons Balmann.

The heads of the academic departments, together with the head of the department of

- Administration and Central Services, Hannelore Zerjeski,

form the directorate of the Institute. Since 1 January 2009, IAMO's Executive Director by rotation is Prof. Dr Thomas Glauben.

In co-ordination with the board of trustees, this collegiate body manages the Institute's business and directs the long-term research and development planning of IAMO. The scientific advisory board advises the directorate and the board of trustees on academic matters and carries out a regular evaluation of the Institute's work.

As of 1/1/2009, the following individuals were members of the board of trustees: MinR. Dr Rudolf Wendt (Chair; Federal Ministry of Food, Agriculture and Consumer Protection), Reg.Dir. Dr Ulrich Neubauer (deputy Chair; Federal Ministry of Food, Agriculture and Consumer Protection), MinDirig. Dr Joachim Welz (Ministry of Education and Cultural Affairs of Saxony-Anhalt), State Secretary Dr Hermann Otto Aekens (Ministry of Agriculture and the Environment of Saxony-Anhalt), Prof. Dr Stephan von Cramon-Taubadel (Georg August University, Göttingen), Prof. Dr P. Michael Schmitz (Justus Liebig University, Gießen), Prof. Dr Bernd Six (Martin Luther University, Halle-Wittenberg), and Dr Reinhard Grandke (CEO of the German Society of Agriculture DLG e.V.).

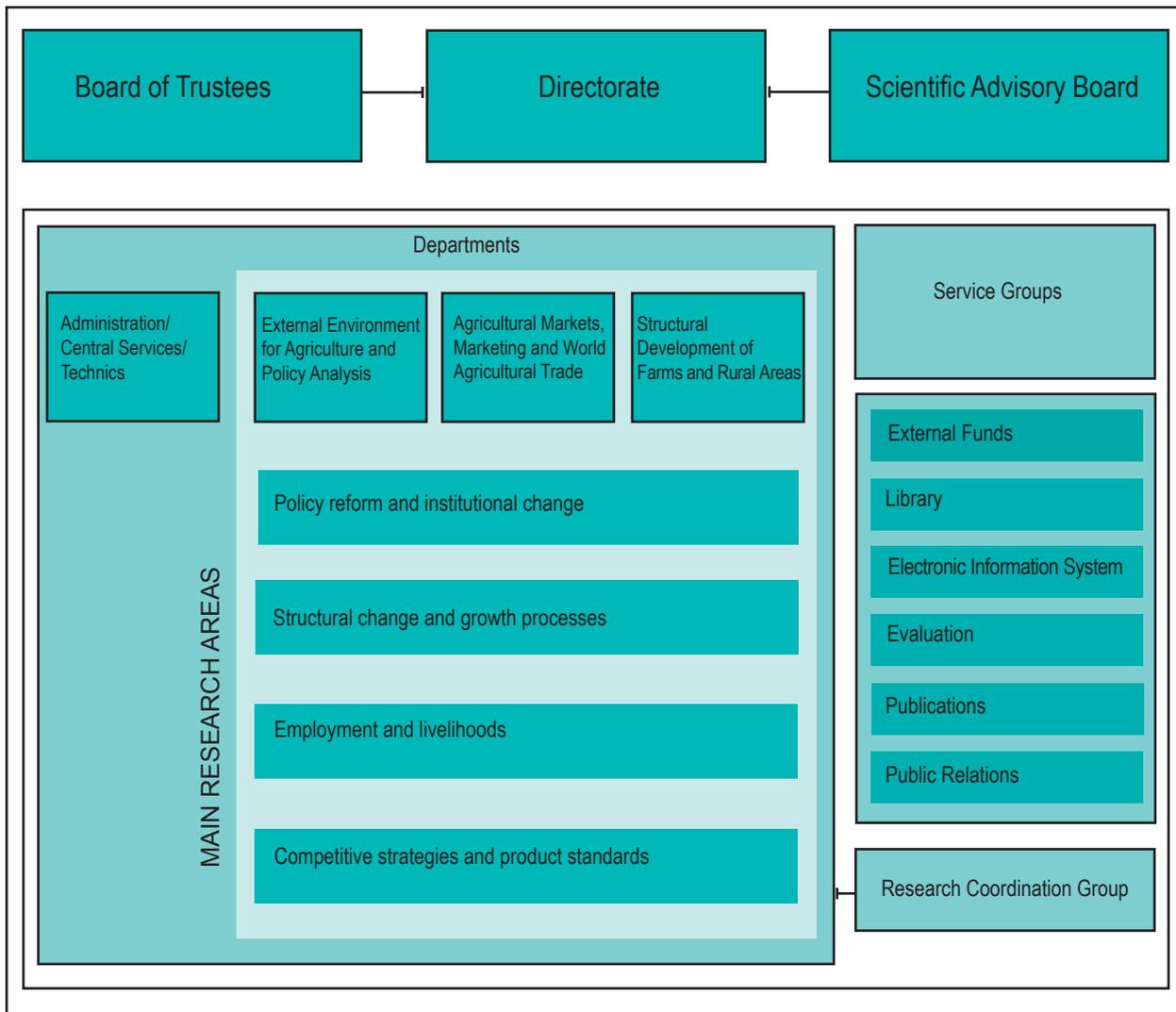
As of 1/1/2009, the following were members of the scientific advisory board: Prof. Dr Stephan von Cramon-Taubadel (Chair, Georg August University, Göttingen), Prof. Dr P. Michael Schmitz (deputy Chair; Justus Liebig University, Gießen), Prof. Dr Michael Grings (Martin Luther University Halle-Wittenberg), Prof. Dr Ernst Berg (Rhineland Friedrich Wilhelm University, Bonn), Prof. Dr Michael Kirk (Philipps University, Marburg), Prof. Dr Ewa Rabinowicz (Swedish Institute for Food and Agricultural

Economics, SLI, Lund, Sweden), Prof. Dr Dr h.c. Ulrich Koester (Christian Albrecht University, Kiel), Prof. Ph. P. Johan Swinnen (Catholic University, Leuven, Belgium) and Prof. Dr Dr h.c. Dieter Kirschke (Humboldt University, Berlin).

### **Cooperation with university institutions**

IAMO's work is closely linked with the Institute of Agricultural and Food Sciences, which is part of the Faculty of Natural Sciences III at MLU, and the Economic Sciences Department at the Faculty of Law and Economic Sciences. The heads of IAMO's academic departments take part in MLU's teaching and committee work. Many academic members of staff from IAMO with post-doctoral and doctoral qualifications are also involved in university teaching, and in the running of a joint summer school as well as a nationwide PhD student programme. At the personnel level the links between MLU and IAMO are also strengthened by the fact that MLU's Prorector of Strategic Planning, Prof. Dr Bernd Six, sits on IAMO's board of trustees.

IAMO also works closely in conjunction with many other universities, chiefly with faculties of agriculture and economics. Depending on the requirements of interdisciplinary research, other social science and humanities subjects may be brought in, e.g. history. As far as our partners in Germany are concerned, we have strong links with Berlin, Bonn, Hohenheim, Kiel, Göttingen and Münster. There are also close relationships with chairs of agricultural economics and institutes at agricultural and economics colleges and universities in our partner countries. Here we should mention the increasingly close cooperation with Chinese universities, but also with other non-university research institutions.



Organigram of the Leibniz Institute of Agricultural Development in Central and Eastern Europe

Amongst our partner universities we should highlight the National Agricultural University of Ukraine (NAUU) and the National University "Kyiv Mohyla Academy", both in Kiev; the Timiryazev Academy in Moscow; the Agricultural University in Astana, Kazakhstan; the Agricultural University in Grodno, Belarus; the Agricultural University of Warsaw; the Agricultural University of Nitra, Slovakia; Corvinus University, Budapest and Gödöllő University, both in Hungary; and the University of National and World Economy in Sofia, Bulgaria. We should also mention Hanoi Agricultural University in Vietnam, and the Centre for Agricultural and Rural Development (CARD) at Zhejiang University in China. In addition, IAMO exchanges a wide range of scientific ideas with the Institute for Agro-economics and the Centre for Transition Economics at the Catholic University in Leuven, Belgium; Wageningen University in the Netherlands; the University of Kent in Canterbury; and the University of Queensland in Australia. In the USA we have close contacts with Stanford University, Ohio State University, Pennsylvania State University, the State University of New York, and with the University of Wisconsin in Madison.

### **Cooperation with non-university institutions**

The numerous contacts with non-university institutions are also very important for IAMO's work. We collaborate with the Institutes of Farm Economics, Rural Studies and Market Analysis and Agricultural Trade Policy at the Johann Heinrich von Thünen Institute (vTI) in Brunswick-Völkenrode, the Leibniz Centre for Agricultural Landscape and Land Use Research (ZALF) in Müncheberg, and the Leibniz Institute for Regional Geography (IfL) in Leipzig. There are close relations with many non-university research institutions in Central and Eastern Europe. Of

note here are: In the Czech Republic, the Research Institute of Agricultural Economics in Prague ÚZEI (VÚZE); in Slovakia, the Research Institute of Agricultural and Food Economics in Bratislava (VÚEPP); in Hungary, the Research and Information Institute for Agricultural Economics (AKI) in Budapest; in Russia, the Russian Scientific Institute for Agricultural Economics (VNIIESH), the Institute of Transition Economics (IET), and the All-Russian Institute for Agrarian Problems and Information Theory (VIAP), all in Moscow; in Ukraine, the Institute of Agrarian Economy at the Academy of Agricultural Sciences in Kiev; in China, the Center for Chinese Agricultural Policy (CCAP) at the Chinese Academy of Sciences; and in Turkey, the Agricultural Economics Research Institute at the Ministry of Agriculture in Ankara. IAMO's partners in Western and Northern Europe are: In France, the Institute for Agricultural and Environmental Engineering Research (Cemagref), Paris, the National Institute for Agricultural Research (INRA) in Rennes, and the National Engineering College for Agricultural Sciences in Paris-Grignon (INA-PG); in Austria, the Austrian Federal Institute of Agro-economics in Vienna; in Sweden, the Swedish Institute for Food and Agricultural Economics (SLI) in Lund; and in Denmark, the Danish Institute of Agricultural Sciences, Tjele.

### **IAMO's Dr Xiaobing Wang wins Leibniz prize for junior academics**

Each year the Leibniz Association awards the Leibniz Prize for Young Academics for the best doctorates from their 86 member institutes over the past two years. The prize is awarded in two categories: "Humanities and Social Sciences" and "Natural and Technological Sciences". For her successful PhD, "Labour market behaviour of Chinese rural households during transition",



*Dr Xiaobing Wang on the right, next to the Federal Minister of Education and Research, Dr Annette Schavan, at the award ceremony for the Leibniz Prize for Young Academics*

Mrs Wang is one of this year's two prize-winners in the "Humanities and Social Sciences" category. Mrs Wang's doctorate is an empirically and theoretically sophisticated contribution to the field of labour market economics. Her findings offer a starting point for the rural population in China, many of whom still live in extreme poverty, to improve their participation in the labour market. She shows ways of improving the most vulnerable personal income situations and of reducing unemployment. High-level, scientifically-based policy advice is what marks out Mrs Wang's thesis as particularly special.

The Leibniz Association Prize for Young Academics is not the first award that Mrs Wang has won. Her dissertation project was supported by the German Research Association (DFG). In 2006 the project won the prize awarded by the Association of Benefactors for German Science and the DFG for a project in the agricultural sciences especially worthy of support. Martin Luther University Halle-Wittenberg also singled out the project as one of the best dissertations of 2007. The award ceremony for the Prize for Junior Academics took place on 27 November 2008 at the Leibniz Association's annual conference in Magdeburg, with the participation of the Federal Minister for Education and Research, Dr Annette Schavan; the Minister President of Saxony-Anhalt, Prof. Dr Wolfgang Böhmer; and the Minister of Education and Culture of Saxony-Anhalt, Prof. Dr Jan-Hendrik Olbertz.

#### **Other prizes for IAMO staff**

Wiebke Meyer won the *Euroleague for Life Sciences (ELLS) Prize for Excellent Master Theses* for her master's thesis on the subject "Income diversification of farm households in Albania". This prize, first awarded in 2008, honours excellent English-language master's dissertations in the life sciences. The founder of



*Wiebke Meyer's master's thesis was outstanding*



*Sven-Oliver Jungklaus receives the Prize for Agricultural Economics*

the prize is Prof. Dr Prof. h.c. Dr h.c. Klaus Macharzina, the former President of the University of Hohenheim. The prize was awarded during the ELLS Conference on 22 November 2008 in Prague. Wiebke Meyer's master's thesis looks at how widespread non-agricultural employment is in agricultural households in northern Albania, and which variables influence non-agricultural income diversification.

Sven-Oliver Jungklaus was one of three winners of the *Prize for Agricultural Economics*, an initiative of the trade journal "Ernährungsdienst" (Food Service), for his outstanding achievements in agricultural and food economics. The reason for his winning the award, besides his dissertation at IAMO, "The role of knowledge in taking up conservation tillage in the Black Sea region", is countless efforts to improve contact between scientific theory and practice. Since October 2008 Sven-Oliver Jungklaus has been working as development manager at BASF Plant Science.

## Supporting young academics

One of the three core tasks of IAMO is to help develop the next generation of researchers. In particular, therefore, the Institute supports the study for doctoral and post-doctoral degrees. At the start of 2009, around 40 theses and 3 post-doctoral theses are being supervised at IAMO. For the first time in 2008, two IAMO staff successfully completed their post-doctoral degrees. The titles of the post-doctoral theses are:

- "Theoretical and methodological topics in the institutional economics of European agriculture. With applications to farm organisation and rural credit arrangements" (Martin Petrick, awarded by the Faculty of Natural Sciences III of Martin Luther University Halle-Wittenberg);
- "Agricultural development. Historical agricultural revolutions and development economics" (Michael Kopsidis, awarded by the Faculty of Law and Economic Sciences at Martin Luther University Halle-Wittenberg).

In the past year two IAMO staff successfully submitted and defended their theses at Martin Luther University:

- "An analysis of agricultural extension for 'collective agriculture' during the first phase of transition (1989-91) using the example of Eastern Germany: Lessons for Korea" (Jeongnam Choi);
- "Multifunctional agriculture in a regional, spatial and dynamic context: An agent-based representation of policy response" (Martin Damgaard).

## Training for doctoral students: Seminars and PhD programme

As part of its educational provision for doctoral students, IAMO runs a PhD student seminar together with the professors of agricultural economics for agricultural business theory, agricultural market theory, agricultural business management, and agricultural policy and agricultural environment policy from MLU's Institute of Agricultural and Food Sciences. The seminar is a forum for swapping ideas about research questions, methodological approaches and findings. In addition, the agro-economic coffee meetings at IAMO provide an opportunity to discuss early, often provisional findings.

The Doctoral Certificate Programme in Agricultural Economics ([www.agraroeconomik.de](http://www.agraroeconomik.de)), designed and run by agro-economic institutes from several German universities, the Johann Heinrich von Thünen Institute (vTI) and IAMO, has been in existence since 2005. The "Doctoral Certificate Programme" provides the first structured training in Germany for doctoral students in the areas of agricultural and food economics and rural development. The systematic teaching of essential theory and method should increase the quality of students' education and improve their efficiency when working on dissertation topics. Doctoral study is the third stage of a consecutive study programme, following bachelor's and master's degrees in agriculture, food and the environment. The PhD study course is jointly run by the Agricultural and Food Economics Faculty of the Christian Albrecht University in Kiel, the Faculty of Agriculture and Horticulture at the Humboldt University in Berlin, IAMO, the Institute of Agricultural and Food Sciences at MLU, The Faculty of Agricultural Sciences at Georg August University in Göttingen, and FAL,

Section Agricultural Economics, Brunswick. The PhD course is based on a modular system. In 2008, IAMO professors and staff helped organise academic events relating to the following modules:

- "Household behaviour: Theory and applications";
- "Applied Industrial Organization";
- "Agent-based Modelling in Agricultural and Resource Economics";
- "Microeconomics of Growth, Poverty and Inequality".

### **Visiting academics at IAMO and summer schools**

The further training and education of academic scholars is one of IAMO's core tasks. As mentioned above, IAMO focuses chiefly on supporting junior academics from our partner countries. Of great importance in this regard are study visits by researchers, which can range from a few weeks to two years. Besides being involved in joint publications, those engaged in long-term visits also concentrate on their doctoral studies, financed by external and IAMO grants, and third-party funded projects. From October 2007 to September 2008, 33 predominantly young visiting academics from 17 countries carried out research at IAMO. By working together closely on international, third-party funded research projects, young researchers from partner countries integrate themselves into the international academic community. Former IAMO staff, both from Germany and partner countries, are now working in international organisations such as the EU and World Bank, or they have acquired management positions in their respective national agricultural administrations. An even larger number of them are continuing their academic careers back in their home countries.

From 4 to 22 July 2008, the sixth summer school on "Agriculture in the Transition Process" took place in Ufa, Russia (Republic of Bashkortostan), which was organised for local agricultural professionals from business, agricultural administration and farming. Dr Vladislav Valentinov from IAMO gave lectures on the role of social capital and the tertiary sector for rural development. Dr Jürgen Wandel and Dr Jon Hanf, also from IAMO, gave lectures on competition policy, vertical integration in agriculture, and strategic management. As in previous years the summer school was organised by Prof. Michael Grings, Chair of Agricultural Market Theory at the Institute of Agricultural and Food Sciences of Martin Luther University Halle-Wittenberg; and was run with the financial support of the German Academic Exchange Service (DAAD).

### **"Pact for Research and Innovation" I: IAMO graduate school**

Under the "Pact for Research and Innovation", which is the equivalent of to the Excellence Initiative of the federal administration and the Länder to promote science and research at German universities, IAMO's application for the funding of a graduate school was approved to the tune of 480,000 Euro. It was launched in 2007 and it deals with the "prospects of small-scale farm structures in the new member states of the European Union." In many Eastern accession countries, semi-subsistence farms still play an important role in safeguarding rural employment and agricultural production, although they are hardly suited to the demands of food chains in the process of modernisation or the increased competition within the enlarged EU. This problem gives rise to the question of whether and how the existing structural deficits in agriculture in many regions of the new EU Member States and accession countries can be overcome;

also, how agriculture in these regions can be successfully integrated into changing supply chains in the food economy, and how the social problems of the necessary structural change can be dealt with. Four German PhD students and three from Hungary, Bulgaria and Albania are now working on individual sub-projects. More information can be found on our web site under the heading "research". The research projects are focusing on the following three topic fields:

- Change in the agricultural sector and business adjustment strategies;
- Inter-enterprise and cooperative adjustment strategies in relation to the demands of supply chains;
- Institutional parameters and implications for (regional) policy.

Besides its research activity, the IAMO graduate school provides systematic support for junior academics. This takes the form of structured training of doctoral students via participation in the Doctoral Certificate Programme in Agricultural Economics (see above), and the involvement of IAMO researchers who have successfully completed their PhDs. The latter will be given the opportunity to develop their research ideas further, and to acquire experience in research management. The high point of the programme was the one-week study module in November 2008 given by the renowned expert Prof. Michael R. Carter of the University of Wisconsin-Madison (USA) on the subject "Microeconomics of Growth, Poverty and Inequality", which was organised in the graduate school and also open to participants in the "Doctoral Certificate Programme" from other institutes.

## **"Pact for Research and Innovation" II: International research group at IAMO**

In the 2008 competition for funding IAMO succeeded in obtaining an additional budget of 665,760 Euro from Pact funds to set up an international research group on the topic, "Economic dynamics and social equilibrium in Rural China." This aims at integrating IAMO's research activities into international networks to analyse the dynamics of agricultural development, as well as socioeconomic and ecological processes in China's rural areas. The research group is intensifying and strengthening existing contacts and cooperations between IAMO and internationally renowned institutions and academics from the field of agricultural economics in China as well as other Western countries. The following are involved in the group: from China, the Center for Chinese Agricultural Policy (CCAP, Prof. Jikun Huang), and the Center for Agricultural and Rural Development (CARD, Prof. Zuhui Hunag); from the USA, Ohio State University (Prof. Belton Fleischer), and Stanford University (Prof. Scott Rozelle); from Europe, the Licos Center for Transition Economics, Belgium (Prof. Johan Swinnen), and the Institut de recherche pour l'ingénierie de agriculture et de l'environnement (Cemagref) in France (Dr Guillaume Deffuant); and the World Bank, Beijing (Dr Achim Fock) as an international organisation. Further details about the research group can be found on our web site [www.iamo.de](http://www.iamo.de). Under the aegis of the research group, three Chinese and two German doctoral students, as well as a Chinese postgraduate began researching at IAMO in 2008.

In eight individual projects, the research group is examining questions of resource-saving enterprise development in the

agricultural sector, employment alternatives, migration in rural areas, and the problem of poverty and its persistence in rural China. Although China has risen to become the fourth-largest economy in the world, the new prosperity is mostly concentrated in the cities. Around 70% of the population live in the countryside, with an income on a par with those in developing countries. More than 100 million people, mostly small farmers, have to make do with less than one dollar per day. The growing inequality between rural and urban China has already become one of the nation's most serious problems. The most important goal of the project, besides an analysis of the current situation, is to draw up scientifically based recommendations for action to combat poverty.

### **Development of third-party funding**

#### **Funded projects for 2008**

##### **I. Research projects for which funding was approved in 2008**

- Project title: Preisbildung und Einkaufsverhalten im Lebensmittel Einzelhandel  
Funded by: DFG-Sachbeihilfe
- Project title: Financial Deepening and Efficiency of Rural Financial Intermediation  
Funded by: DFG-Sachbeihilfe
- Project title: Das Wachstum der sächsischen Landwirtschaft 1750-1880  
Funded by: DFG-Sachbeihilfe
- Project title: Study on the Functioning of Land Markets in the EU Member States under the Influence of Measures applied under the Common Agricultural Policy  
Funded by: EU Tender, CEPS

- Project title: Trade, Agricultural Policies and Structural Changes in India's Agrifood System (TAPSIM)  
Funded by: 7. Forschungsrahmenprogramm der EU
- Project title: Work Prorammm Vetpro – LEONARDO DA VINCI Programm, Lifelong Learning Programm  
Funded by: EU, GD Bildung/Kultur, Bildung für EUROPA
- Project title: Die zukünftige Bedeutung und Funktionen von Genossenschaften in einem vertikalisierten Agri-Food Business  
Funded by: DZ Bank-Stiftung

##### **II: Ongoing externally funded research projects in 2008**

- Project title: Agroholdings im Agrar- und Ernährungssektor in Russland: Entstehungsgründe, Funktionsweise und Entwicklungsperspektiven  
Funded by: DFG-Sachbeihilfe
- Project title: Ökonometrische Wirkungsanalysen von Fördermaßnahmen für die ländliche Entwicklung (FOR 986)  
Funded by: DFG-Sachbeihilfe
- Project title: Modelle betrieblichen Strukturwandels (FOR 986)  
Funded by: DFG-Sachbeihilfe
- Project title: Deutsch-ungarisches Kooperationsprojekt "Market power in German and Hungarian food chains"  
Funded by: DFG
- Project title: Werte als Motive von Konsumententscheidungen – Ein interkultureller Vergleich  
Funded by: DFG-Sachbeihilfe

- Project title: Social Capital and Informal Social Networks in a Changing Natural and Institutional Environment  
Funded by: DFG-Sachbeihilfe
- Project title: Preisbildung und Wettbewerb auf räumlich differenzierten Märkten – Simulation und Analyse komplexer Marktstrukturen am Beispiel des Rohmilchmarktes  
Funded by: DFG-Sachbeihilfe
- Project title: Modern Agriculture in Central and Eastern Europe. Tools for the Analysis and Management of Rural Change (MACE)  
Funded by: 6. Forschungsrahmenprogramm der EU
- Project title: Sustainability of Semi-Subsistence Farming Systems in New Member States and Acceding Countries (S-Farm)  
Funded by: EU-IPTS
- Project title: Enlargement Network for Agripolicy Analysis (AgriPolicy)  
Funded by: 7. Forschungsrahmenprogramm der EU
- Project title: Structural Change in Agriculture and Rural Livelihoods (SCARLED)  
Funded by: 6. Forschungsrahmenprogramm der EU

### III. Externally funded research projects completed in 2008

- Project title: Transformation landwirtschaftlicher Familienbetriebe in der VR China  
Funded by: DFG-Sachbeihilfe
- Project title: Key Factors Influencing Economic Relationships and Communication in European Food Chains (FOODCOMM)  
Funded by: 6. Forschungsrahmenprogramm der EU

- Project title: Micro-Economic Instruments for Impact Assessment of Multifunctional Agriculture to Implement the Model of European Agriculture (MEA-Scope)  
Funded by: 6. Forschungsrahmenprogramm der EU
- Project title: Croatia's EU-accession and its socioeconomic implications for farm households  
Funded by: Gesellschaft für Technische Zusammenarbeit (GTZ)
- Project title: The role of social capital and informal social networks for poverty reduction in Northern Thailand  
Funded by: Eiselen-Stiftung Ulm

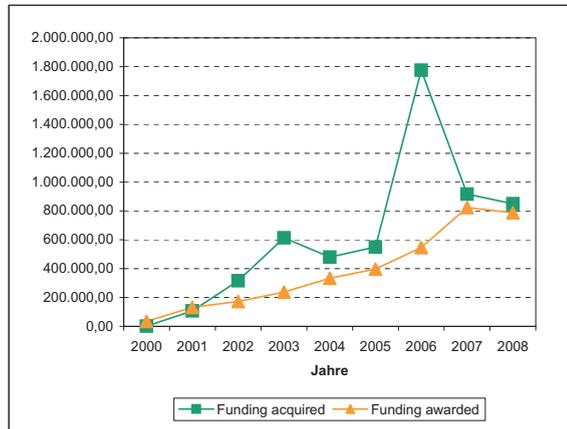
### Selected projects with third-party funding

Below is an outline of the most important projects for which new funding was obtained in the period October 2007 to September 2008. There are three new DFG projects and two new EU projects.

### DFG project on capital accumulation in transition countries

Rural banks in transition countries can rarely offer complex financial products. Because of this, cooperatives or micro-financing organisations often appear on the rural finance market. The effect this has on the capital accumulation and efficiency of the rural finance market is the subject of a new DFG project, "Analysis of capital accumulation and efficiency in the rural finance market", which is being jointly undertaken by IAMO and ETH Zurich (Swiss Federal Institute of Technology). The application for the project was submitted by Prof. Dr Gertrud Buchenrieder (IAMO), Dr Raushan Bokusheva (ETH Zurich) and PD Dr Martin Petrick (IAMO). Running the project at IAMO is Florian Amersdorffer.

## Development of funding



Source: *Institute's own statistics.*

The research is based on a quantitative analysis of the scope and depth of financial intermediation in rural Bulgaria between 2000 and 2006. A shadow price approach is being employed to examine the efficiency and productivity of various financial institutions. A comparison between allocative and technological efficiency will then assess the potential degree of financial service provision in rural areas. The data come from the Bulgarian national bank (macro level) and from a survey of rural financial institutions in three selected regions in Bulgaria (micro level). The findings should also be useful when considering other transition countries with similarly structured financial systems.

### DFG project on consumer behaviour in food retail

1 January 2009 saw the start of a project approved by the DFG, entitled: "Pricing and purchasing behaviour in food retail: An analysis looking at dynamic processes." The project is based

on a proposal drafted by Prof. Jens-Peter Loy (Kiel University), Prof. Thomas Glauben (IAMO) and Prof. Jutta Roosen (Technical University, Munich). At IAMO the project is being carried out by Nadine Wettstein, Dr Jon Hanf and Dr Stephan Brosig. The starting point of the research is the high level of price competition in the German food retail sector. Some important phenomena of pricing from a dynamic perspective have yet to be explained. There is a need for substantial research, especially with regard to the determinants of consumer brand choice and shop selection, and how these are reflected in pricing. Two sub-projects at retail level are looking at price rigidity and price adjustment, as well as the coordination and synchronisation of the latter. At the consumer level, two other sub-projects are analysing shop selection, shopping frequency and market loyalty. There needs to be an empirical review of micro-economic models to explain pricing in the food retail sector. The project has a number of goals: Testing the assumptions and findings previously used in micro-economic models, developing premises for future modelling, using the findings to put together recommendations for an appropriate competition policy, and setting new pointers for a consumer-oriented market policy amongst enterprises.

### DFG project on the growth of Saxon agriculture 1750-1870

In March 2008, on the basis of a positive assessment given by their "Economic Sciences" council, the DFG approved the project "The growth of Saxon agriculture 1750-1880". The submission was drafted by PD Dr Michael Kopsidis of IAMO and Prof. Ulrich Pfister of Münster University. In the 18<sup>th</sup> and 19<sup>th</sup> centuries Saxon agriculture was by far the most productive and progressive in Germany. The reasons for the outstanding productivity of Saxon agriculture are to a large extent still unknown.

The analysis of Saxon agriculture is an estimation of regionally differentiated product functions, using data records which, for their time, are astonishingly good. The aim of the project is to gain insights into the extent and kind of technological change in agriculture. This is the first time such an analysis has been used for the German-speaking world in this early period, but also at an international level it represents an innovation in research into economic history. The focus is on questions of market-supported regional division of labour, and the analysis is looking at whether these actually have a positive effect on productivity growth, as the theoretical assumptions suggest. Econometric studies are also being used to reconstruct the process of the formation of a highly integrated internal market for Saxony, and to identify the role that changes in transaction and transport costs played in this. The project also seeks to rediscover Central Germany as a powerful economic centre of European rank. For centuries it was one of the most important and highly dynamic economic zones in Germany.

### **EU project on policy impacts on multifunctional land use**

As part of the 7<sup>th</sup> EU Research Framework Programme, approval was given for the project "Prototypical Policy Impacts on Multifunctional Activities in Rural Municipalities" (PRIMA). IAMO has substantial involvement in this project, coordinated by the Institut de recherche pour l'ingénierie de agriculture et de l'environnement (Cemagref, France), which has eleven partners from eight different countries. Under the leadership of Dr Kathrin Happe, researchers from IAMO and other institutions are developing agent-based models to evaluate the policy impacts on multifunctional activities in rural communes. The object of PRIMA is to provide an ex-ante evaluation of the impact of

policy measures down to the local level. The agent-based models should build on realistic assumptions about the behaviour of actors who have an effect on land use at a local level (farmers, forestries, tourism, consumers). Case studies are being used to ensure that the behaviour assumptions are realistic and that they derive from contact with the relevant actors. The modelling in the PRIMA project will be important for policy advice, as it can scientifically work out the conditions in which multifunctional activities in agriculture are most likely to develop, and also which are the best policy strategies in this area.

### **Policy advice for the EU in Project AgriPolicy**

The project "Enlargement Network for Agripolicy Analysis", which is also under the aegis of the 7<sup>th</sup> Research Framework Programme of the EU, got underway on 1 June 2008. The project is scheduled to run for two years. Under the leadership of the French company, Euroquality, two Western European research institutions are involved in the project besides IAMO. Also participating are institutes and experts from the twelve new member states and the seven potential accession countries. The project is focusing on agricultural policy advice for the EU, a statistical analysis of agricultural policy measures, and expanding the analytical expertise of the institutes involved. AgriPolicy will also help create a networked European Research Area (ERA), which the European Commission sees as one of the most important goals of its research policy. Under the leadership of Dr Axel Wolf and Prof. Gertrud Buchenrieder, IAMO is primarily responsible for the coordination of all studies on the topic of rural development, as well as for the organisation of three workshops on this issue. More information on this project can be found at <[www.agripolicy.net](http://www.agripolicy.net)>.

## IAMO lecture activity

Besides contributing to publications, another important activity of IAMO staff is the presentation and discussion of research findings at national and international conferences, forums and workshops. A large proportion of lectures by IAMO staff are delivered at events with an international audience, and in 2008 almost two-thirds of all lectures were given abroad. The costs of 40 of the 102 lectures given in the period 1/1/08-30/9/08 were met by the organisers (22) or by third-party funding (18). In the last few years the level of engagement of our staff members in presenting their research findings has been consistently high. The number of papers delivered by IAMO staff at international conferences and specialist symposia has remained at a high level over the past few years.

## Conferences and seminars

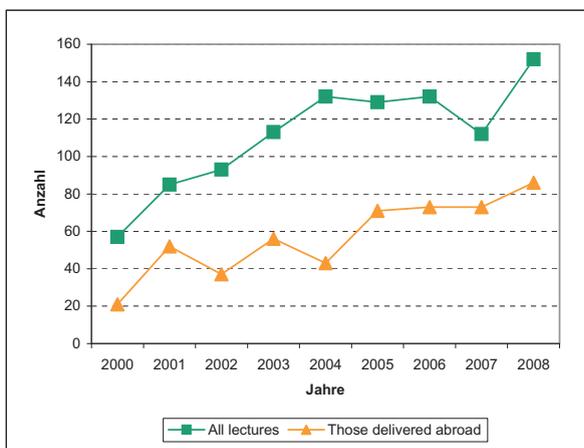
Conferences and seminars are essential for IAMO to be able to fulfil its third core task, which is to act as a forum for the exchange of academic ideas in all questions of agricultural development in transition countries. The events organised by the Institute represent an important platform for scientific exchange, both on a national and international scale. Besides greater academic collaboration, the meeting of academics with decision-makers from the food industry and politics often provides an impetus for restructuring in the agricultural and food sectors in partner countries. Below is an outline of the most important conferences, symposiums and workshops run by the Institute in 2008.

### Agricultural policy symposium at Green Week 2008

As part of the International Conference of Agriculture Ministers, which has replaced the East-West Agricultural Forum, IAMO

ran an agricultural policy symposium on 18 January 2008 as a parallel event during Green Week. The subject of the symposium was "Consumer potential in China and Russia". The event was aimed at policymakers, businesspeople and academics. At first glance, a market of more than one billion consumers, as exists in China and Russia, seems to offer an inexhaustible sales potential. But what is often overlooked is the extreme regional economic divide in China and Russia. Groups with purchasing power are predominantly concentrated in booming urban

### Development of IAMO lectures



Source: Institute's own statistics

agglomerations, whereas rural areas are often at the level of developing countries and suffer from severe widespread poverty. In fact, there is an urgent need for differentiated analyses of future market demands. Our understanding of how demand on these important markets will develop in the future is fairly poor. At the symposium, renowned experts discussed the potential these markets have to offer to the Western food retail sector, as

well as a number of other questions. The speakers were Prof. Prof. E.h. Dr Hallier (CEO of the EHI Retail Institute) and Dr Karl-Heinz Engel (Chairman of a variety of dairy associations and of the board of Erbeskopf Eifelperle eG). Afterwards there was an intense podium discussion on the topic of "Globalisation, and food quality and security" with renowned individuals from business, organisations, politics, and academia.

### **IAMO Forum 2008**

Organised by the Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), the IAMO Forum 2008 took place on 25-27 June with the title: "Agri-Food Business: Global Challenges – Innovative Solutions". The conference attracted more than 170 participants from over 20 countries. The first day was devoted to the exchange of scientific ideas, whereas the second day was more oriented towards providing a discussion forum for representatives from the academic, political and business communities. The IAMO Forum was rounded off with a one-day study visit.

The two plenary sessions, "Quality" and "Bioenergy", were organised by academics and managers of international organisations. The main speakers representing the academic world were: Spencer J. Henson from the University of Guelph in Canada; Prof. Dr Alois Heißenhuber from the Technical University in Munich; and the former Dutch Minister of Agriculture and President of the EU Council of Ministers, Prof. Dr Cees P. Veerman of the University of Wageningen. Other speakers were: Dr Keith Wiebe, head of the FAO's "Comparative Agricultural Development Service"; Dr Christian Patemann, former programme director of "Biotechnology, Agriculture and Food" in the European Commission's Research Directorate-General; and

Dr Torsten Gabriel, the press spokesman of the Agency for Renewable Resources e.V. (FNR). Sessions with lectures were held on the following topics:

- Structural changes in China's agricultural and food economy;
- Voluntary compliance and standardisation;
- Competition in the agricultural and food economy: The business companies;
- Competition in the agricultural and food economy: International markets;
- Pricing behaviour and market structure;
- Agricultural factor markets;
- Agroholdings – A new type of business organization in the CIS member states(invited lecturers);
- Bioenergy and agriculture;
- Standardisation and certification;
- Verticalisation and marketing;
- Special session in honour of Klaus Frohberg (guest speakers).

In addition to the lecture sessions there were two poster sessions. The topics of the plenary sessions were:

- Globalization of food systems: Implications for small holder agriculture in developing countries;
- Public and private incentives to adopt enhanced food safety controls;
- Global perspectives for agriculture and the role of Europe;

- The European Union en route to sustainable renewable Bio-Energy – Policies and Perspectives for Research;
- Bioenergy in Germany;
- Rivalry between Food and Bioenergy – What are the Policy Recommendations?

The "Best Paper Award", presented for the first time, went to Johan F. Swinnen and Thijs Vandermoortele of the Catholic University of Leuven (Belgium) for their paper, "The Political Economy of Nutrition and Health Standards in Food Markets", in which they develop a general model to determine when "overstandardisation" and "understandardisation" are present. The "Best Poster Award", also presented for the first time, went to Tamás Mizik from Corvinus University in Budapest. In his paper, "Bioethanol: The new tool of surviving", Tamás Mizik uses a comparative approach to analyse the prospects of bioethanol production in Hungary.

All papers given at the conference can be found on our web site at <[www.iamo.de/forum0/forum2008.html](http://www.iamo.de/forum0/forum2008.html)>. A special edition of the journal *Outlook on Agriculture* has been published already, containing in revised form the best papers from the conference. There is also conference volume with a selection of revised papers, which can be downloaded from our web site at <[www.iamo.de/dok/sr\\_vol46.pdf](http://www.iamo.de/dok/sr_vol46.pdf)>.

## **Events announced for 2008**

### **Agricultural policy symposium at Green Week 2009**

At the International Conference of Agriculture Ministers during Green Week in Berlin, IAMO organised, as a parallel event, an agricultural policy symposium on the topic: "20 years of transition – Does the global consumer now exist?" The one-day symposium took place on Friday, 16 January 2009. The lectures addressed the question of whether consumer behaviour across the globe has, in fact, largely oriented itself to the Western model, or whether it is only a few leading regions in emerging nations that are exceptions. Other questions for discussion are the consequences that the creation of a "global consumer" might have for the agricultural and food sector, and the prospects for rural consumers with low-level incomes.

### **2009 IAMO Forum**

As in previous years, IAMO is organising the IAMO Forum 2009 on 17-19 June 2009 on the topic: "20 Years of Transition in Agriculture: What Has Been Achieved? Where Are We Heading?". Twenty years after the fall of the Berlin Wall it is time to take stock of the economic and political developments in the agricultural and food sector, the radical changes in rural society, and the changes in the management of natural resources in Central and Eastern Europe since 1989. There will also be discussion of the effects of transition on theory, and the future outlook for research. The IAMO Forum 2009 will take place in conjunction with a special session organised by the European Review of Agricultural Economics (ERAЕ) and the European Association of Agricultural Economics. The papers from this session, together with a selection of the best papers at the 2009 IAMO Forum are to be published in a special edition of ERAЕ.

## Publications

Academic staff at IAMO publish their findings in scientific journals, monographs, anthologies and discussion papers. A complete list of publication can be found on IAMO's web site on the Internet ([www.iamo.de](http://www.iamo.de)). The diagram below illustrates the development of numbers of articles published in journals by IAMO staff since 2000. In addition to the rise in general publication activity over the long term, we can point to the marked increase in 2008 in high-quality refereed articles listed on the Science Citation Index (SCI) and the Social Science Citation Index (SSCI). The principal strategy of IAMO is to increase the quality of published work rather than focusing on numbers. The success of this strategy is shown by the diagram.

## Discussion papers

The Discussion Paper series continued in 2008 with the following publications that can all be downloaded free in PDF format from the IAMO web site ([www.iamo.de/doc/###](http://www.iamo.de/doc/###)):

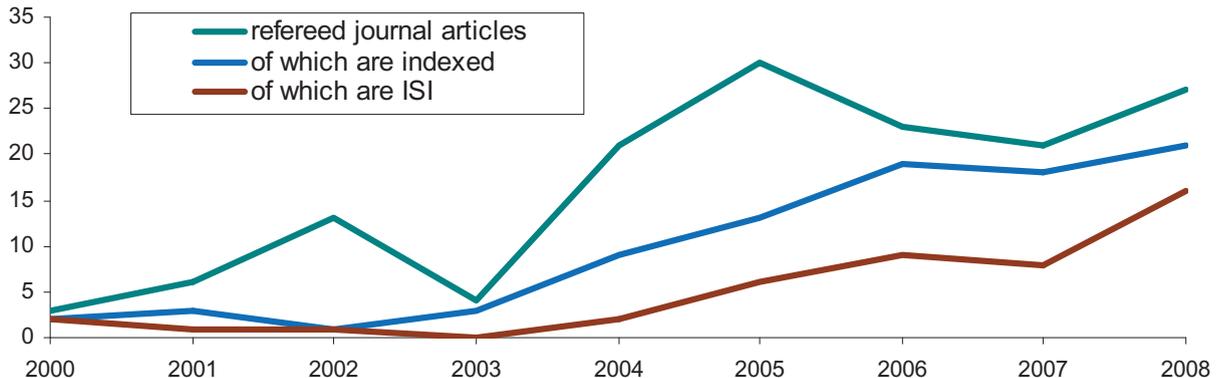
CECHURA, L. (2008): Investment, credit constraints and public policy in a neoclassical adjustment cost framework, *IAMO Discussion Paper No. 115*, Halle (Saale).

FRITZSCH, J. (2008): Applying fuzzy theory concepts to the analysis of employment diversification of farm households: Methodological considerations, *IAMO Discussion Paper No. 116*, Halle (Saale).

PETRICK, M. (2008): Landwirtschaft in Moldova, *IAMO Discussion Paper No. 117*, Halle (Saale).

SROKA, W., PIENIADZ, A. (2008): Rolnictwo obszarów górskich Bawarii przykładem dla Karpat polskich? Studium porównawcze, *IAMO Discussion Paper No. 118*, Halle (Saale).

### Development of numbers of articles published in refereed and indexed journals



Source: Institute's own statistics.

MEYER, W., MÖLLERS, J., BUCHENRIEDER, G. (2008): Does non-farm income diversification in northern Albania offer an escape from rural poverty?, *IAMO Discussion Paper No. 119*, Halle (Saale).

WEITZEL, E.-B., KESKIN, G., BROSIG, S. (2008): Der türkische Tomatensektor – Regionale Gesichtspunkte und räumliche Markt-integration, *IAMO Discussion Paper No. 120*, Halle (Saale).

### **Studies on the Agricultural and Food Sector in Central and Eastern Europe**

In the series of "Studies on the Agricultural and Food Sector in Central and Eastern Europe" IAMO publishes monographs and conference proceedings that deal with agro-economic issues in Central and Eastern Europe. All publications from volume 22 onwards can be downloaded from the internet free of charge <[www.iamo.de/dok/sr\\_vol###.pdf](http://www.iamo.de/dok/sr_vol###.pdf). Until now in the studies-series 21 conference proceedings and 25 monographies have been published. In 2008 the following volumes were published:

WEHRHEIM, P., SCHOELLER-SCHLETTER, A., MARTIUS, C. (eds.) (2008): Continuity and change Land and water use reforms in rural Uzbekistan – Socio-economic and legal analyses for the region Khorezm, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 43*, Halle (Saale).

CSAKI, C., FORGÁCS, C. (eds.) (2008): Agricultural economics and transition: What was expected, what we observed, the lessons learned, Proceedings (Volume I and II), *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 44*, Halle (Saale).

PETRICK, M. (2008): Theoretical and methodological topics in the institutional economics of European agriculture, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 45*, Halle (Saale).

GLAUBEN, T., HANF, J. H., KOPSIDIS, M., PIENIADZ, A., REINSBERG, K. (eds.) (2008): Agri-food business: Global challenges – Innovative solutions, *Studies on the Agricultural and Food Sector in Central and Eastern Europe, Vol. 46*, Halle (Saale).

### **IAMO on the Internet**

The Institute's Internet presence ([www.iamo.de](http://www.iamo.de)) aims to provide outsiders and interested users with a quick overview of IAMO's core tasks and aims, as well as of staff research topics, findings and publications. Our Internet presence is based on the Open Source Content Management System TYP03.

Each member of staff has the opportunity to maintain and update the content of their individual pages independently. This ensures that the site is very much up to date. The web site also aims to achieve the goal of maximum accessibility. The advantages of an accessible-to-all, standard compatible web site are: Access for all users, easy maintenance and smaller file sizes. From the home page, which gives information on news, events and the most recent publications, users can access information from the Institute, Research, Events, Publications and Portal categories. The Institute menu leads to information about IAMO's core tasks, institutional structure, staff and library.

Via the library page, online searches of the library catalogue can be made using OPAC. Current job vacancies can also be found via the Institute menu. The Research menu leads to information

about current research projects, with short project descriptions and details of the staff involved, select publications, and research cooperation with other institutes. The Events menu provides details of the annual events either organised by the Institute, or in which IAMO is taking part. These include the IAMO Forum, the PhD workshop, as well as seminars and workshops on a variety of possible topics.

Here, users can find out about programmes and speakers in advance, and view papers that have been submitted. The on-line service also provides access to all in-house publications (IAMO Series, IAMO Discussion Papers, IAMO Annual Reports

and IAMO Annual). Publications by staff members can either be viewed in the complete publication list, or directly on the individual staff pages. The Portal menu contains a comprehensive and structured collection of links.

Since October 2007 the IAMO web site also has its own alumni homepage <<http://www.iamo.de/alumni/index.html>>.

[alumni@iamo.de](mailto:alumni@iamo.de) is the communication and service network for former IAMO staff members and visiting researchers. It provides a large number of activities to help alumnae and alumni keep in contact and share their experiences, and thus maintain a life-long connection with each other.



*Prof. Dr Peter Tillack at the 2008 IAMO Forum*



*View of inner courtyard at IAMO*

## How to find us

### » *by car*

**From the south:** Leave the A9 motorway at the Rippachtal junction, and take the A38 towards Merseburg. At the Halle-Süd triangle change onto the A143 and follow this road until the Halle-Neustadt/Halle-Zentrum exit. Then take the B80 for about 8 km towards Halle until you get to Rennbahnkreuz. At the entrance into town get into the left-hand lane and go straight on along the B80 towards Kröllwitz/Universität. Turn left at the ice-rink and follow Blücherstraße to the end. Then turn right. At the end of the avenue turn left into Theodor-Lieser-Straße. IAMO is in the building on the right-hand side.

**From the north:** Take the A9 motorway (Berlin-Munich) as far as Halle/Brehna. Follow the B100 towards Halle until you reach the outskirts of the city (traffic lights at Dessauer Brücke). Get into the right-hand lane and turn left, still on the B100 to Zentrum and Magdeburg. Turn right immediately into the B6 towards Magdeburg and then take the next exit (Zoo, Wolfensteinstraße). Carry on along Wolfensteinstraße (underpass, several traffic lights, Reilstraße/Große Brunnenstraße crossing) until you reach Burgstraße. Turn right and take the next available left turning over Saalebrücke. Once over this bridge take the first right turning, drive back under the bridge and continue along the embankment of the Saale. Turn left at the next crossroads into Weinbergweg towards Universität, and follow the road until the next set of lights. Continue straight ahead into Walter-Hülse-Straße. The IAMO building is on the right-hand side. Turn right into Theodor-Lieser-Straße and IAMO is now in front of you.

**From the north-west:** Coming from Magdeburg take the A14 (direction Leipzig or Dresden) to the Halle-Peißen exit, then take the B100 to Halle. See "From the north" for further directions.

**From the west (on the B80):** Follow the B80 until the Rennbahnkreuz. At the entrance into town get into the left-hand lane and continue along the B80 towards Kröllwitz/Universität. Turn left at the ice-rink and follow Blücherstraße to the end. Then turn right. At the end of the avenue turn left into Theodor-Lieser-Straße. IAMO is in the building on the right-hand side.

### » *by train*

Leave the station by the main exit and follow signs to the tram stop "Riebeckplatz/Hauptbahnhof". From here take tram number 4 towards Kröllwitz. Alight at the Weinberg Campus stop (about 15 minutes from the station). The Institute is on the left-hand side of the road as you get out.

### » *by plane*

Leipzig-Halle airport is 20km from Halle. A regular shuttle train takes you to the main station. See "By train" to find the way from there.



## Publisher's note

IAMO's publications also include the series of in-house *Discussion Papers*, the series *Studies on the Food Sector in Central and Eastern Europe*, and the *Institute's Annual Report*.

*Photos* Ministerium für Landwirtschaft und Umwelt des Landes Sachsen-Anhalt (S. 5), Wiebke Meyer (S. 9), Sybille Mundt (S. 11, 50, 53, 54, 87, 100), Botagoz Kazbogarova (S. 12), Hauke Schnicke (S. 28, 36, 42, 56, 62, 68, 74), Insa Theesfeld (S. 38, 39), Alexej Lissitsa (S. 80, 101), Leibniz-Gemeinschaft/David Ausserhofer (S. 86), Sabine Deeken (S. 87)

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